# Journal OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION


*AVMA Convention—Cleveland, August 19-22, 1957*


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**Vol. 130** **APRIL 15, 1957** **No. 8**

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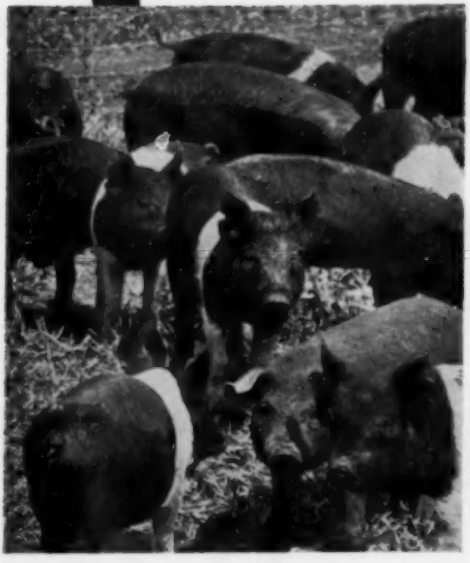

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# Correspondence

March 20, 1957

Dear Dr. Aitken:

I was interested in the article "An Allergic Condition in Jersey Cows" in the JOURNAL (Feb. 15, 1957: 181).

The condition described has been seen in our area for a long time and has affected other breeds in addition to Jerseys. It does seem to affect the Channel Island cows more frequently than others, possibly, as suggested, due to a difference in the protein make-up of their milk. Second, it has been seen in animals of various ages but is much more common in younger animals. Repeat cases have been seen by some observers with whom I have talked. Thirdly, I have seen at least one case in which the affected animal showed only signs of colic without any of the manifestations of urticaria. Such animals when being "dried off" present a problem in diagnosis since their advanced state of gestation tends to confuse the condition with such things as torsion of the uterus, impending abortion, etc. They respond to being milked and to the use of antihistamine.

I trust that these comments will tend to set straight certain impressions left by the article published.

Sincerely yours,

s/J. Ellis Croshaw, Jr., D.V.M.,
Philadelphia, Pa.

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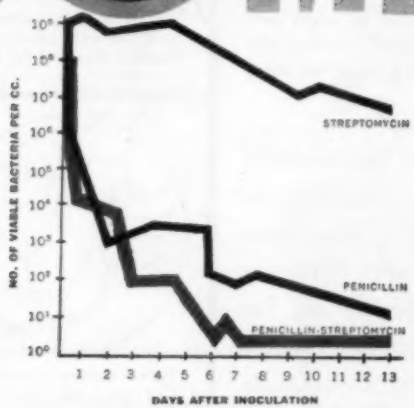
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1. Welch, H.: Antibiotic Med. & Clin. Therapy *3*:375 (Nov.) 1956. 2. Adapted from Hunter, T. H.: J.A.M.A. *144*:524 (Oct. 14) 1950.

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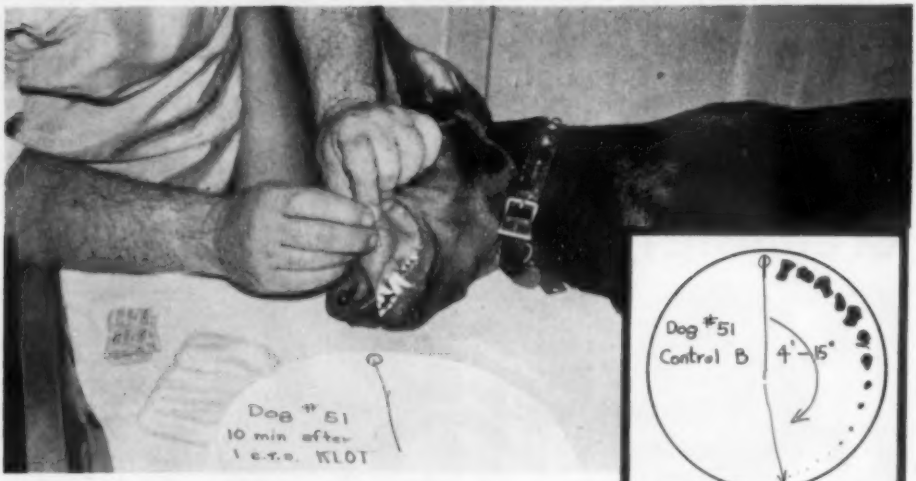


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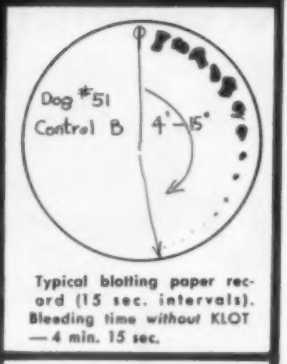


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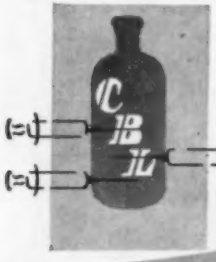

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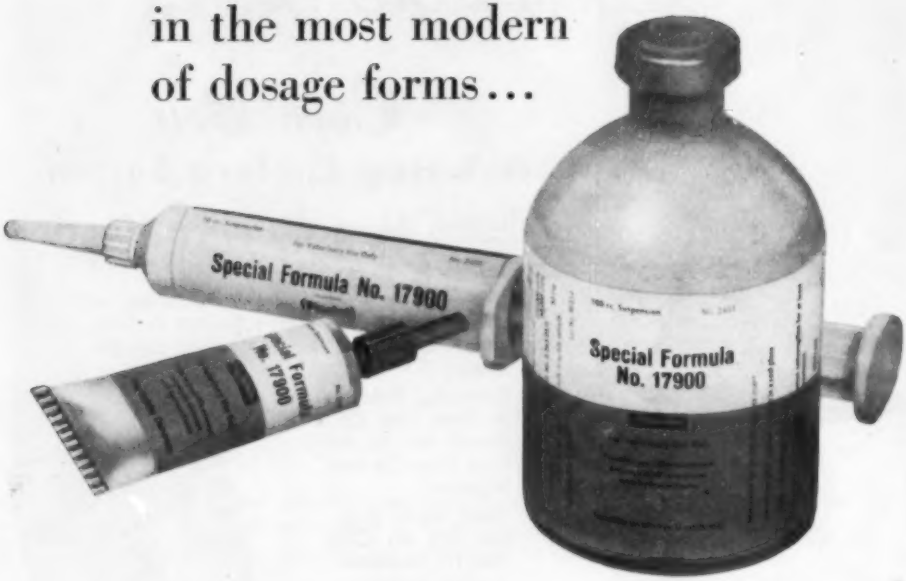


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# News From Washington

Since veterinarians are covered under the self-employment provisions of the Social Security Act, those performing **professional services on a fee basis** for Agricultural Research Service, U.S.D.A., **are not subject to the withholding provisions** of the Federal Insurance Contributions Act. Effective Jan. 1, 1957, deductions will not be made from payments, regardless of when the professional services were performed. Further, regional business offices have been advised by the director of the Budget and Finance Division, U.S.D.A., to make adjustments for amounts withheld during the calendar year 1957, and amounts deducted refunded.

* * * *

**"Defense Against Radiological Fallout on the Farm"** (Farmers Bull. 2107), a publication of U.S.D.A., will be available May 1. It should be of interest to all veterinarians, particularly the general practitioner. It may be obtained from: Superintendent of Documents, Government Printing Office, Washington 25, D.C. Information on cost not available as of March 25. Price probably will not exceed 25 cents per copy.

* * * *

**Legislative Action**—Senate Committee on Agriculture, in executive session March 21, favorably reported a clean bill (in lieu of S.313, 645, and 1128; see JOURNALS, Feb. 15, March 15, 1957: adv. p. 16 and 18) providing for compulsory poultry inspection. AVMA witness, Dr. H. E. Kingman, Jr., testified before the committee at the hearing on February 28; also presented AVMA statement on poultry inspection to the House Committee on Agriculture, March 7. House Committee on Agriculture scheduled hearings for April 2 on humane slaughter bills (see JOURNAL, Feb. 15, 1957: adv. p. 16).

The Kilday subcommittee, House Armed Services Committee, had reported favorably on H.R. 3516, giving Walter Reed Army Institute of Research authority to award certain degrees (see JOURNAL, March 15, 1957: adv. p. 18). When some segments of higher education opposed this action, the subcommittee decided to reconsider, in order to hear from protestors. Dr. Ward Darley, speaking on behalf of the American Council of Education, objected on the general principle that no federal agency "standing alone" should be authorized to grant graduate degrees. Supporting the Army were Dr. William Stone, dean, University of Maryland Medical School, and Dr. Colin MacLeod, professor of Research Medicine, University of Pennsylvania. The view of the latter is that quality counts; if academic standards are kept high, government should not be disqualified; also the Army Institute supplies advanced training in preventive medicine the regular institutions do not readily offer.

House Armed Services Committee favorably reported H.R. 2822, a bill which repeals requirements in existing law for professional examinations of medical, dental, and veterinary officers of the Army and Air Force as a step toward promotion. The requirement was suspended during World War II and anew in 1951. (Note—Navy medical and dental personnel are not required by statute to take professional examination for promotion.)

* * * *

**New Bills—Hog-Cholera Virus**—H.R. 5933, introduced by Rep. George M. Grant (D., Ala.), would control preparation, distribution, importation, and exportation of virulent hog cholera virus.

**Humane Methods in Slaughter of Livestock and Poultry**—H.R. 5671, 5820, introduced respectively by Reps. McMillan (D., S. Car.), Dorn (D., S. Car.); S. 1497, Senators Humphrey (D., Minn.), Neuberger (D., Ore.), Purtell (R., Conn.).

**Compulsory Poultry Inspection**—H.R. 5398, 5463, 5489, 5738, introduced respectively by Reps. (Mrs.) Sullivan (D., Mo.), Elliott (D., Ala.), Polk (D., Ohio), Dixon (R., Utah); S. 1620, introduced by Senator Murray (D., Mont.), would place inspection in Food and Drug Administration.

**Provide further protection against dissemination of diseases of livestock and poultry**—S. 1628, introduced by Senator Ellender (D., La.) (by request).

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# CANINE DISTEMPER VACCINE

*Modified Live Virus—Chick-Embryo Origin—Desiccated*

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A single 2cc dose injected into healthy animals induces a prompt immunity. It is well tolerated and will not produce distemper in healthy pups. Its potency and safety is determined by protection tests on highly susceptible animals such as ferrets or pups.

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**Follow** with one pint of solution to every 30-40 gallons of water for prevention of dysentery and for growth stimulant.
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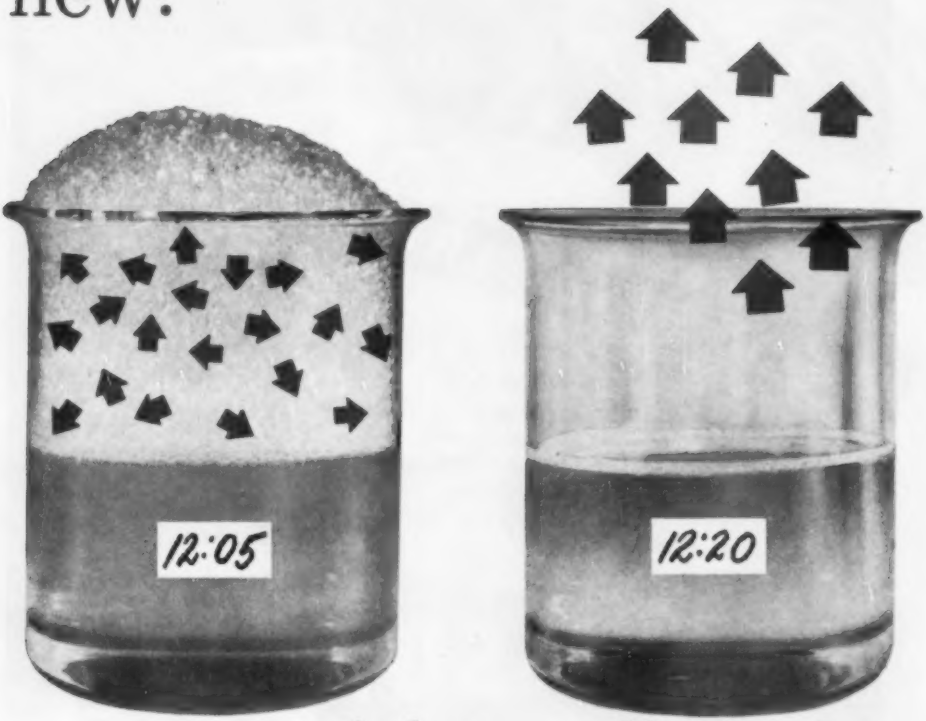


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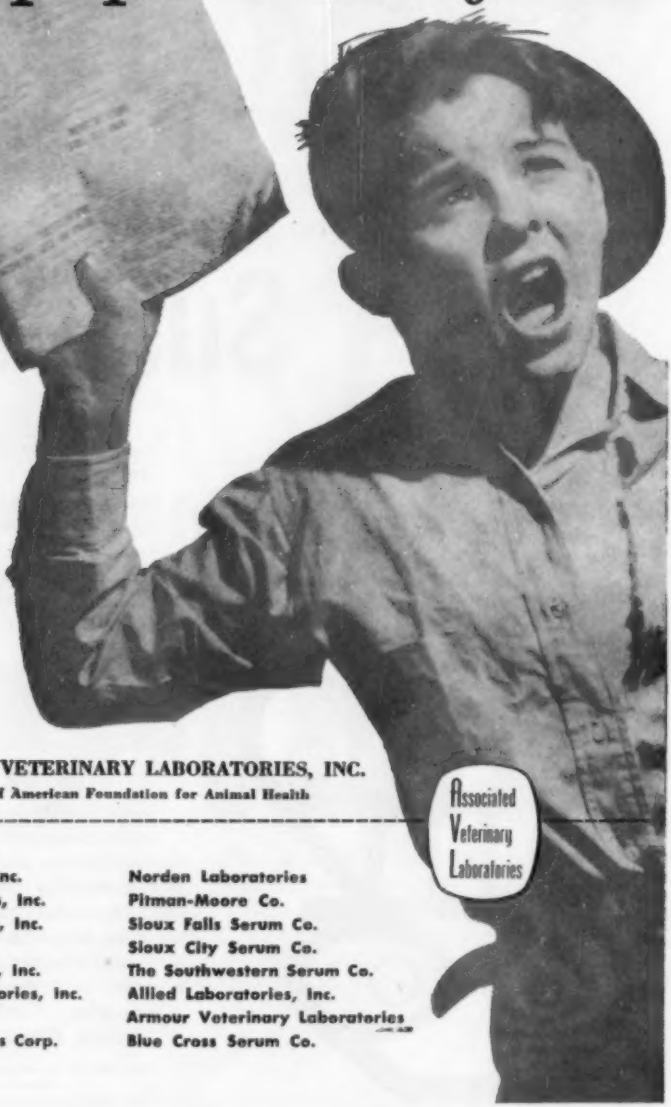


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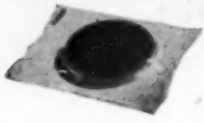

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# Some Aspects of Nitrate Intoxication in Livestock

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*Columbia, Missouri*

THE PROBLEM of nitrate poisoning in livestock has many more aspects than are generally recognized. The purpose of this paper is to draw attention to various phases of this problem and to suggest relationships among them. Sometimes, knowing what to look for aids in making a diagnosis. In nitrate poisoning, there may be a lot of things for which to look.

The nitrate intoxication most familiar to veterinarians is the type seen when animals are poisoned by the inorganic salts of nitrate or nitrite, the usual source being agricultural chemicals carelessly applied to fields or otherwise left where animals had access to them. These chemicals may also be mistakenly used in place of common salt, with disastrous losses.

The cereal grasses, such as oats, wheat, barley, corn, and sorghums of all types, and many pasture grasses readily concentrate nitrate under drought conditions. As this is usually potassium nitrate ($KNO_3$), the intoxication produced in cattle and sheep poisoned by eating hay with a high nitrate content closely parallels nitrate poisoning produced by the inorganic nitrate or nitrite. This was first reported in the United States in 1937[16] under the name "oat hay poisoning," a nitrate poisoning complex[1,2,4,7,10,21] as was suspected in 1890.[22]

Numerous weeds also concentrate nitrates under drought conditions, or naturally carry a high nitrate content.[1,7,18-20,22] Many important forage crops, besides the small grains, corn, and sorghums, may also concentrate high levels of nitrate under adverse growing conditions such as existed in Missouri during 1954 and 1955 (table 1).[13] Since legumes, such as alfalfa, and the forage crops, such as corn and sorghums, readily concentrate high levels of nitrate, it is important to consider the amount of nitrate that may be present in both the hay and silage because these are the main ration fed. Our experience shows that *any amount of nitrate over 0.5 per cent in the total ration* is a potential cause of trouble. Even with additional carbohydrate and vitamin A, any amount over 1.5 per cent of nitrate in the total ration is dangerous and losses are likely to occur.[18]

TABLE I—Nitrate Content of Some Forages Grown in a Missouri Drought Area

| Forage | % $KNO_3$ Equivalent |
|---|---|
| Cornstalk | 8.04 |
| Corn silage | 2.04 |
| Alfalfa hay | |
| First cutting | 0.25 |
| Second cutting | 0.66 |
| Third cutting | 0.46 |
| Fourth cutting | 0.11 |
| Fifth cutting | 0.54 |
| Sorgo silage | 0.87 |
| Sweet potato vines | 4.11 |
| Pigweed | 1.80 |

When high available nitrogen is present in rich soil under drought conditions, the plants are unable to utilize the crude plant foods which then concentrate in the plants as a nitrate compound (table 1).

Based upon analyses made at the Missouri Experiment Station, the level of nitrate in the corn plant is less than the 18.3 per cent $KNO_3$ reported in 1890 and in pigweed it is much less than reported by many other workers. Other common weeds

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that carry high nitrate levels in the Missouri area are Jimson weed, chickweed, white lambsquarter, smartweeds, velvet weeds, sunflower, bull nettle (*Solanum carolinense*), black nightshade, ground cherry, giant ragweed, Johnson grass, milk purslane, *Euphorbia maculata*, and barnyard grass. Several of the weeds are independently poisonous, as well as having enough nitrate content to poison cattle and sheep. Of the forage crops in the Missouri area, corn and sudan grass have been the worst offenders with regard to nitrate concentration.

The loss of production in a milking herd as the result of feeding excess nitrate in silage or silage plus alfalfa and, also, the benefit from adding a source of energy (molasses) in an effort to correct the loss of production is shown (graph 1). This graph, based on both experimental animals and field cases, shows that even with the nitrate intake under 2 per cent of the total ration, dairy cattle may need additional sources of carbohydrate. The treatment used was the extra energy supplied by molasses.

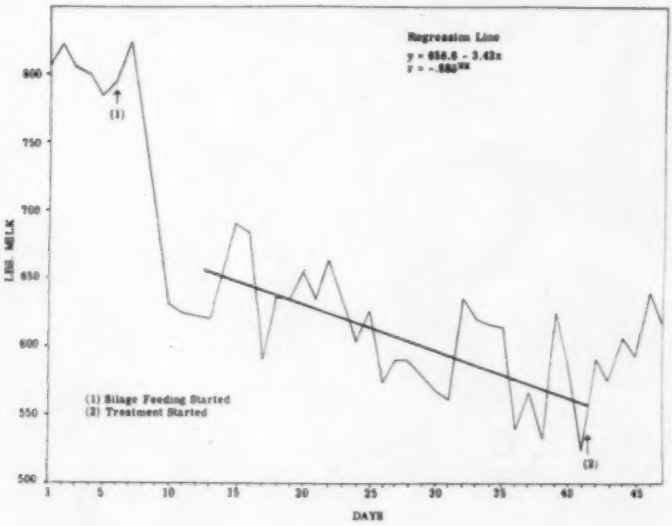
Surface water stored in ponds and lakes may contain dangerous amounts of nitrates or nitrites because of natural nitrification processes or contamination by drainage from feedlots or cultivated fields.[21] Shallow wells in glaciated areas are particularly likely to have a high nitrate content.[12,23] A significant correlation exists between high nitrate in the well water and organic contamination or use of commercial fertilizer in fields near the wells.[23]

Many ponds and some of the shallow wells in Missouri have had enough nitrite to impair the health of man or animals. There have been numerous reports of methemoglobinemia in infants where their formula was prepared with water from wells with a high nitrate content.[23]

Most of the signs of poisoning conform to those usually described; the chief one is an overwhelming anoxia due to the methemoglobinemia, resulting from conversion of the nitrate to nitrite and its absorption from the digestive tract.

If the amount of nitrate eaten is not too great, many cattle will respond to quiet handling plus an antidote administered intravenously. Methylene blue (1 to 4%) in a 5 per cent glucose solution or in a 1.8 per cent sodium sulfate solution is most often used; in an emergency, use 1 per cent in boiled tap water. This is about 2 Gm. of methylene blue per each 500 lb. of body weight. The results have not been as dramatic as reported in infants.[9]

In the treatment of any animal, the dosage must be adjusted according to the age, weight, and species. In cattle poisoned by variegated thistle, California workers found that quiet and rest were often more




Graph 1—This graph shows the loss of production in a milking herd, due to excess nitrate in silage or silage plus alfalfa, and the benefit derived from adding a source of energy as treatment.

effective than treatment. Except for wild range animals, however, treatment should save many animals that would probably die without it.[7,21] In our experience, treatment is indicated, but all possible causes of the poisoning must be considered. For instance, when treating for prussic acid poisoning, if some nitrate (nitrite) poisoning were present, the use of any antidote which contained nitrite might be fatal. Caffein stimulants are beneficial in some instances, but adrenaline is contraindicated. Where possible, slow-drip continuous intravenous medication is more effective for severely poisoned cattle.

### CORNSTALK INTOXICATION

Since the middle of the nineteenth century, a rapidly progressive and fatal intoxication of cattle has been occasionally reported from the North Central states under such names as "forage poisoning" or cornstalk poisoning."[24] It has been extensively studied[1,7,20,22] but was not generally considered to be a form of nitrate poisoning. However, workers[5,14] were able to show that both methemoglobinemia and nitrosohemoglobinemia were present and the extreme anoxia usually described in this condition was due to these abnormal blood bonds.

The heavy losses of beef cattle which occurred over much of Missouri and adjoining states during the autumn of 1954[4-6] were so nearly identical to those that were experienced in Iowa, as reported in 1939,[19] that there is little doubt that it is the same kind of condition.

The Iowa workers could not demonstrate the methemoglobinemia which is seen where the inorganic nitrates are the cause of the poisoning. The blood of animals sick from grazing in the drought-stricken cornfields did not have normal appearing blood. It resembled the blood from animals poisoned by carbon monoxide.

The nitrosohemoglobin closely resembles the carbon monoxidehemoglobin in its absorption and reflection characteristics. This would cause confusion in the field and laboratory, except that the conditions under which the two poisonings can occur are so different. A simple test which readily differentiates nitrosohemoglobin from carbon monoxidehemoglobin is performed by boiling a sample of blood until it coagulates. Upon cooling, if the color is a bright pink, like salt peter-cured meat, a nitrate complex is present rather than a carbon monoxide-induced poisoning.

The gastrointestinal irritation often seen with simple nitrate poisoning, due to inorganic nitrates and nitrites, was also observed in the animals stricken from grazing in drought cornfields. Usually, at postmortem examination, a strong odor of nitrogen dioxide was noticed upon opening the rumen.

The odor was the same as that noticed about the "fuming" silos of this area during the silage-making season in 1954. This heavy, lethal, brownish to yellowish red gas with a pungent odor resembling a laundry bleach was deadly nitrogen dioxide.[6]

Man, as well as animals, has been fatally poisoned by nitrogen dioxide gas while working in or about silos during filling and for a few days afterward.[4,11] The amount of this gas that will cause poisoning is as low as 10 to 20 parts per million (p.p.m.).[18] Silos may generate several hundred parts per million at the peak of the abnormal nitric acid fermentations.[3] The juice that drained from such silos was also lethal for any species of animal; even grass, weeds, and shrubs which grew along the silo drains were killed.[4]

The silage, at first highly acid and stained yellow by the nitric fumes, gradually became lower in nitrate and nitrite content as it lost its sour pH (under pH 1 in some silos). However, some silage remained dangerous as late as April, 1955, and the contents of one silo caused chronic nitrite poisoning in sheep during the fall of 1955 and winter of 1956.

Several silos in Missouri have exploded in recent years. One reinforced concrete silo exploded about 11 hours after it was filled in August, 1956. There is a possibility that nitrated cellulose products may be partly responsible. Several such silos exploded more violently than would seem possible with simple gas pressure. Large amounts of gas are soon generated in silos where the forage in them contains excessive amounts of nitrate, although the amount of nitrate does not have to be large if the weather is hot (100 F.) when the silo is filled.

### FIELD TESTS

The field test found to be most useful is the diphenylamine qualitative test for nitrate. Veterinarians in affected areas who

wish to test suspected forages should not be without this rapid screening test.

The full strength reagent is made by dissolving 500 mg. of diphenylamine in 20 cc. of water, then cautiously adding concentrated sulfuric acid to make 100 cc. This mixture is cooled and stored in a brown bottle.

The field test is made with half strength reagent (equal parts strong reagent and 80% sulfuric acid).* This test is reliable where nitrate content of forage is high enough to be potentially dangerous. Pond water and protein-free filtrates of blood of other tissues can be screened with diphenylamine, but the stronger reagent should be used to detect nitrate in small amounts. If nitrate is present, a blue color rapidly develops when the reagent is dropped on the test material.

The intensity of the blue color and the rapidity with which the color develops is an indication of the amount of nitrate present. A greenish color indicates that nitrite should also be tested for by the specific test for nitrite. The colors other than blue or green can be ignored as far as nitrate tests are concerned.

Sometimes, nitrite is the offending poison rather than nitrate. This may be true of ponds with fixed nitrites and of corn during severe drought conditions. Perhaps, the best test for the practicing veterinarian is the diazotization test,† which is specific and quite sensitive. The positive reaction is development of a pink or bright rose-pink if nitrite is present in the test material. If this reaction shows an intense color reaction within a few seconds after the test solution is placed on the test subject or mixed with suspected water, a quantitative test for nitrite should be made.

The test is performed by adding 2 cc. of the unknown water, plant juice, or extract to 2 cc. of the A solution; then adding 2 cc. of the B solution; and gently mixing. The development of various shades of rose-pink to dark rose-red indicate the presence of nitrite. If man or animals have to use the water or forage that shows nitrite present on this test, a quantitative test for nitrite should be performed to determine how much nitrite is present.

On cornstalks or other large plants, it is easier to slash the stalk and apply the test solutions, 3 or 4 drops at a time, directly to the pith. Drought-stunted corn may have so much nitrite present that the color becomes a dark rose-red within seconds after the B solution is dropped on the test spot. This corn, when grazed, proved lethal for cattle.

*CAUTION.—This reagent is very corrosive; personnel and materials must be protected from accidental contact with the reagent.

†The A solution is made by dissolving 500 mg. of sulfanilic acid in 150 cc. of 20 per cent glacial acetic acid. The B solution is made by dissolving (with gentle heat) 200 mg. of alpha-naphthylamine hydrochloride in 150 cc. of 20 per cent glacial acetic acid. Each is stored in a dropper bottle away from light.

### OTHER UNUSUAL NITRATE POISONINGS

In addition to cornstalk intoxication, there are several other conditions that do not conform to the usual pattern for nitrate or nitrite poisoning. Among these are blue-green algae poisoning (water-bloom) and cane hay poisoning.[17] These conditions are characterized by rapid onset and a rapidly progressive and fatal course marked at first by unsteadiness, dyspnea, blindness, depression or mania, cyanosis of the mucous membranes, and the gasping, choking symptoms similar to prussic acid poisoning which these conditions closely resemble in the field.

Necropsy may reveal the usual gastrointestinal irritation, vascular changes, and liver degeneration or necrosis. Kidney irritation is often marked and there have been reports of hemorrhagic nephritis.

One thing that these atypical nitrate intoxications all have in common is an unfavorable prognosis. One hundred per cent of the cattle with cornstalk intoxication, during the Missouri disaster in 1954, died regardless of the treatment used.

Other workers report about the same results with blue-green algae poisoning (Canadian report) and cane hay poisoning. Few animals lived as long as 24 hours after they were first noticed sick, and many were found dead within four or five days, as a rule, after the cattle were turned into the fields. Often, the blue-green algae intoxication is much more rapid in onset, sometimes killing the animals before they can move away from the algae-infested water. Our experience is that swine are even more susceptible to blue-green algae intoxication than are cattle and sheep. In this area, this condition most nearly resembles prussic acid poisoning as it is first seen in the field but prussic acid antidotes are ineffective and, if they contain nitrite,

are lethal. Like the animals with cornstalk intoxication, the animals poisoned by algae made only temporary response to treatment, as a rule.

### SUBCLINICAL NITRATE POISONING

Although reported in rats,[8] subclinical nitrate intoxication has not been generally recognized or reported in cattle, sheep, or swine. It is produced by sublethal amounts of nitrate taken over a long period of time. It has been produced experimentally in cattle, sheep, and guinea pigs by Missouri workers and has been observed in field cases. It can easily be confused with other conditions, such as mold poisoning or the drug idiosyncracies.

The outstanding lesion seen in this type of intoxication is degeneration and reactivity of the vascular tissues in the brain, heart, lungs, liver, kidneys, and testes.[8]

The signs of this poisoning may vary over a wide range from normal-appearing cows which abort their calves to cows which are not actually sick but have lowered milk production, rough hair, and the general appearance of having been through a long, difficult winter, although it may be early autumn. Many such cows will have a history of digestive upsets and founder. The same may be true of feeder steers.

Usually, the cows eat a ration of silage and legume hay, such as alfalfa, or some combination in which the total amount of nitrate exceeds the safe level (0.5% of total ration). Many instances have been seen in Missouri where the nitrate made up about 1.5 per cent of the total ration.

An example of this is the well-cared-for Aberdeen Angus herd in which many calves born at, or just before, full term never started respiration. Blood analyses revealed severe methemoglobinemia in the calves, as well as presence of nitrate and a deficiency of vitamin A in the cows. The cows were apparently normal and healthy. Their ration consisted of free choice alfalfa and silage which appeared to be of excellent quality. However, upon chemical analysis, the hay was found to have 0.6 and the silage 0.7 per cent of nitrate ($KNO_3$ equivalent) which exceeded the safe level. There have been numerous other instances of this kind of trouble in both dairy and beef herds. In dairy herds, such a high level of nitrate is likely to lower milk production, as well as cause breeding difficulties.

This condition has also been seen on green pastures and chopped fresh forages, especially sudan grass and corn. Upon analysis, the forage often exceeded the 1.5 per cent level of nitrate and, occasionally, it exceeded 2.0 per cent of the whole ration on a dry weight basis. Again, the cows appeared normal and healthy but abortions occurred which closely resembled those of brucellosis or leptospirosis. The blood plasma nitrate exceeded 16 mg. per 100 cc. of blood in the cows that were about to lose their calves or that had just aborted. In such cows, the plasma vitamin A was often only 3 $\mu$g. per 100 cc. of blood. This is common with lower levels of excess nitrate, in cattle and sheep, and may explain why vitamin A supplements have often been helpful. Whenever abortions appear in herds of cattle, sheep, or swine free of infectious diseases, look for the possibility of a subclinical nitrate intoxication. This condition is apparently much more prevalent than is generally recognized.

Nitrate in sublethal amounts caused impaired reproduction in rats.[15] While normal control females delivered normal litters, the rats on a ration containing 1 per cent of potassium nitrate lost 25 per cent and those at the 2 per cent level lost 80 per cent of their litters.

A marked decrease in milk flow followed the addition of as little as 0.75 per cent of nitrate to the ration of dairy cows.[15] At the 1.25 per cent level of potassium nitrate in the ration, milk production dropped 50 per cent in a few days. The effects of the lower level of nitrate were partially offset by addition of extra energy (molasses) to the ration but 1 cow on the 1.5 per cent nitrate level for 15 days did not recover production and died 30 days later of chronic nitrate poisoning.

The experimental findings support field observations and indicate a need for additional research on this problem.

### SUMMARY

Excessive nitrate content of feed plants is an increasingly important cause of poisoning in farm animals. Forage plants such as oats, sorghums, corn, and certain weeds have long been known to cause losses, especially in cattle, because of nitrate concentration in the plant during adverse growing conditions.

Recently, the combination of drought and heavy fertilization has caused poison-

ing by plants usually considered safe for forage, e.g., cattle which grazed in drought-stricken cornfields. Also reported in 1954 and 1955 was the death of human beings, as well as animals, from breathing nitrogen dioxide gas which formed as the silos were being filled. The oxides of nitrogen formed when forage that contained nitrate was made into silage.

Alfalfa, clovers, sorghums, and such common weeds as pigweed, lambsquarter, smartweed, and Jimson weed have been found to have enough nitrate to poison animals which grazed on them. The weeds were often a large part of the forage which was chopped and made into silage or fed fresh.

The signs vary from abortion and decreased production to severe intoxication that soon ends in death, the severity depending on the excess (over 0.5%) of nitrate in the ration. Cattle and sheep on high quality rations could tolerate more (1.5%) nitrate in the total ration, while cattle on poor or deficient rations died from less (0.7%). Often, the cows on a high nitrate ration did not show clinical signs of poisoning other than abortion or cessation of milk production.

Occasionally, where no one part of the ration was dangerous, the combination of forages resulted in an excess of nitrate. Alfalfa (or clover) often contained 0.6 and the silage 0.7 per cent of nitrate.

Nitrite was more dangerous than nitrate; it proved to be ten to 15 times as toxic. Many farm ponds contained over 5 parts per million of nitrite during 1954 and 1955, often causing intoxication in the animals that had to drink it.

Disturbances similar to laminitis were often observed where cattle and sheep were eating rations with a high nitrate content, or were grazing on young small grain pastures, and where the nitrate exceeded 0.5 per cent of the total ration. In animals of breeding age, irregularities of reproduction as well as lowered milk production occurred.

Addition of carbohydrate and vitamin A help to reduce the toxicity if the nitrate content of the total ration is not over 1.5 per cent.

Re-evaluation of the fertilization programs and, if possible, the use of irrigation to reduce the nitrate concentration by the plants are beneficial during adverse growing seasons.

In seasons marked by severe or extended droughts, it would be wise to have chemical analyses made on the hay, silage, and pasture plants so that any possibility of excessive nitrate could be avoided.

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*Increasing Fluoridation.*—The U. S. Public Health Service has reported that, in 1956, about 1,400 cities and towns with a total population of over 30,000,000 were using fluoridation, in contrast with 12 communities with a population of 328,000 in 1946. In Canada, in 1955, 17 municipalities with a population of 356,000 employed fluoridation.—*Canad. J. Pub. Health, Feb., 1957.*

*Length of Swine and Meat Yield.*—There is little correlation between length of a market hog and the percentage of lean cuts in its carcass. At the Iowa Swine Testing Station, carcasses of the 10 shortest barrows averaged 27.6 inches long and yielded 48.1 per cent of lean cuts, while the 10 longest averaged 30.9 inches, with 48.4 per cent lean cuts. The ideal was considered to be a 200-lb. hog with 1.3 to 1.5 inches of back fat and a carcass 29 to 30 inches long.—*Farm J., March, 1957.*

*Notes on Cattle Practice.*—Infectious tracheitis has been diagnosed recently in northwestern Iowa, but it may have been present for some time as a complication of shipping fever.

The grazing of drought-damaged cornfields in 1956 caused some digestive disturbances and intoxications in cattle. The animals staggered and some went down. Calcium gluconate and glucose solution, intravenously, and cathartics were beneficial. —*J. K. Dewar in Iowa Vet., Jan., 1957.*

The highest priced Guernsey to sell at public auction during 1956 was a bull sold to the Western Pennsylvania Artificial Breeding Association, Clarion, Pa., for $11,500. The 2 highest priced Guernsey cows for the year sold for $9,000 and $8,200.—*Guernsey Breeders' J., Jan. 15, 1957.*

## Cortisone Complicates Infections

In one year, a hospital had six patients in whom cortisone therapy was believed responsible for enhancing infection, resulting in three deaths. Four had bacterial infections, 1 Monilia, and 1 histoplasmosis. Both of the latter died.

These cases seemed to parallel an experiment with rabbits. When given an intradermal injection with living streptococci, they normally developed an acute local inflammation which promptly healed; however, when cortisone was given before this injection, the rabbits showed no local response, appeared healthy for a few days, then died suddenly. They showed no gross lesions at necropsy "but on microscopical study, the animals seemed to have been converted into living culture mediums"; colonies of streptococci were found in all tissues with little inflammatory response. —*New England J. Med., Jan. 17, 1957.*

*Cortisone from a Poisonous Weed.*—A weed, *Agave lecheguilla*, which is poisonous to livestock, may become a new source of cortisone. The weed contains smilagenin from which cortisone can be made. The weed, which grows in great quantities over thousands of square miles in Texas, may also provide cordage fiber for making rope and cord.—*Sci. News Letter, Feb. 2, 1957.*

*Farm Size Trends.*—Family-sized farms are not dying out, they make up the same proportion of the nation's farms as they did in 1939. The average size of big farms (over $25,000 production per year) has decreased in the 15 years—from 2,900 to 1,939 acres. Production on big farms has, in the meantime, decreased from 35 to 32 per cent, while family farm production has increased from 59 to 62 per cent.—*Farm. J., March, 1957.*

*The Raccoons' Intelligence.*—Raccoons learn more quickly than marmosets and cats but less quickly than monkeys and chimpanzees. Raccoons are classified as arboreal carnivores.—*Sci. News Letter, Feb. 16, 1957.*

The pig was found to be the most intelligent domesticated animal in America, in tests at Cornell University. This includes comparison with the dog and the cat.—*Breeder's Gaz., March, 1957.*

## Symposium on Poisoning—Part 3

*At the sixth annual seminar of the American College of Veterinary Pathologists, held in Chicago on Nov. 27, 1955, members discussed poisoning in animals. Summaries of cases 1-8 were published in the Jan. 1, 1957,* JOURNAL, *pp. 12-22; cases 9-16 in the April 1, 1957,* JOURNAL, *pp. 296-306. Cases 17-22, presented here, complete the publication of the material submitted to the* JOURNAL *from the 1955 meeting.*

CASE 17—HALOGETON POISONING IN A EWE —*W. A. Anderson, D.V.M., and Ward T. Huffman, D.V.M.*

*History.*—Severe losses had occurred in herds of sheep near Malta, Idaho. Halogeton (*Halogeton glomeratus*), a poisonous weed, was found on the range where they grazed. Experimentally, a healthy, mature, 90-lb. ewe was fed 228 Gm. of air-dried Halogeton which was collected from the range. The ewe showed salivation, depression, progressive weakness, and was in a coma for several hours before she died, 24 hours after the feeding. At necropsy, there was excessive fluid in the peritoneal cavity, congestion of the liver and kidneys, and considerable edema between the rumen and abomasum. Tissues were saved for histological examination.

*Comments* (Dr. Anderson).—Histological sections show congestion of the kidney (fig. 30) and a deposition of calcium oxalate crystals within the lumen of the tubules. These appear as double refractile spicules and sheaves which plug the collecting and convoluted tubules. Nearly all the nephrons are affected. In addition, many casts are present and Bowman's spaces contain a pink-staining precipitate. It is highly probable that these changes resulted in acute renal failure.

*Diagnosis.*—Halogeton poisoning in a ewe, with congestion and deposition of calcium oxalate crystals in the kidney.

*Discussion* (Dr. C. C. Morrill, Mich.).—*Halogeton glomeratus,* a poisonous range plant of foreign origin, is rapidly spreading over the overgrazed ranges of the Intermountain States. It is said to cover 6 million acres of western range land. Ordinarily, it is not a palatable plant and is usually avoided by all classes of livestock. Therefore, poisoning usually occurs in the fall and winter when other grasses are scarce. However, there are times when sheep seem to prefer it to other plants. Halogeton causes fatal poisoning of cattle if 2.6 per cent of the total feed consists of the poisonous plant. Cows fed 915 Gm. of the green plant died within 24 hours.

Lieutenant Col. T. C. Jones, V. C. (Washington, D. C.).—Oxalic acid poisoning has been produced

Case 17 was presented by Dr. W. A. Anderson, Denver, Colo.

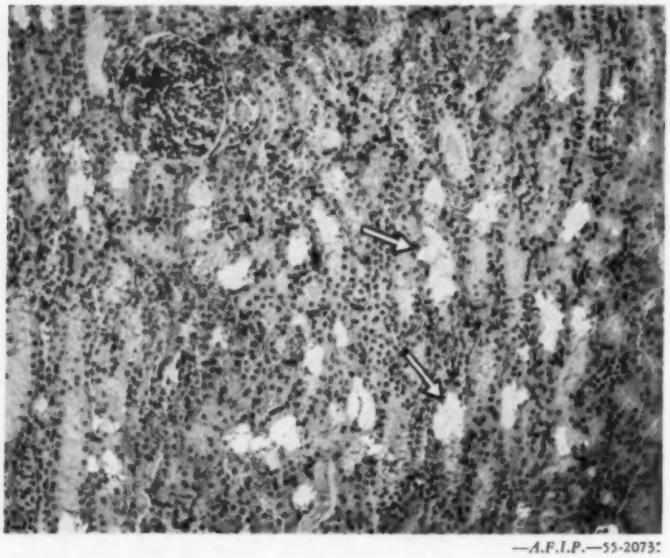

Fig. 30—Section of kidney from a ewe with Halogeton poisoning (case 17), showing congestion and deposition of calcium oxalate crystals within the lumen of the tubules (arrows). This photograph was taken with polarized light. H & E stain; x 125.

—*A.F.I.P.*—55-2073

in rats fed a ration containing 30 per cent spinach.

Dr. H. A. Smith (Texas).—Halogeton is one of the plants which cause photosensitization in animals that have eaten it.

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Vauter, L. R.: *Halogeton Glomeratus*—A Range Plant Poisonous to Sheep and Cattle. California Vet., July-August, 1950.

CASE 18—CORNSTALK POISONING OF CATTLE—*Cecil Elder, D.V.M., M.S.*

*History.*—In September, 1954, a carcass of a crossbred Shorthorn-Jersey heifer, 8 months old, was presented for necropsy and diagnosis. This animal was 1 of 7 which had died in a herd of 24 which had been pastured on cornstalks for only one week. The first death occurred the day before this animal was brought in. The sick animals made no response to any treatment and all died within a few hours after the onset of illness.

Fig. 31—Drought-stricken corn in a field where losses (case 18) occurred. Note the stunted growth.

Case 18 was presented by Dr. Cecil Elder, School of Veterinary Medicine, University of Missouri, Columbia.

The author acknowledges the assistance and advice of Drs. L. D. Kintner and A. A. Case, School of Veterinary Medicine, University of Missouri.

Fig. 32—This opened gallbladder of a cow with cornstalk poisoning (case 18) shows well-marked edema.

In the fall of 1954, similar losses occurred on about 25 farms in west-central Missouri. These farms were in drought-stricken areas and the corn was usually too poor to harvest (fig. 31). Losses usually occurred about one week after cattle were turned onto the cornstalks.

*Comments.*—Usually the first sign of trouble was finding 1 or 2 dead cattle. The percentage affected decreased with age. Those examined while still alive had normal or subnormal temperatures. They were hypersensitive and, when corraled, they often became violent, crashing into the fences and charging anyone they encountered. There was terminal depression, and death generally occurred within 12 hours after the first symptoms appeared.

Petechiae were prominent in the subcutaneous tissues, on the thymus, and in serous membranes of the abdominal cavity and heart. The rumen was full of cornstalks. The small intestines usually were empty and showed catarrhal enteritis but the large intestines often contained blood. No gross changes were found in the spleen, lungs, genitals, or the lymph nodes. The gallbladder wall usually was edematous, the fluid being amber colored. The liver was swollen, mottled, and frequently appeared bluish, probably due to edema of the capsule. The finely gray mottled areas microscopically were found to be due to severe and striking necrosis of liver cells (fig. 33).

*Diagnosis.*—Cornstalk poisoning in cattle. This was based (1) on elimination of nitrate poisoning by failure to demonstrate the chocolate coloring of the blood, even though the cornstalks contained a high nitrate level; (2) on the positive nitroso reaction; (3) on the history of the cases.

*Discussion.*—In several fields where losses occurred, considerable corn smut was present. *Aspergillus glaucus* has been suspected but we do not think it is the cause of this particular condition.

The cornstalks in the field, in which this case occurred, showed a high nitrate level when tested. However, nitrate poisoning is associated with a chocolate color of the blood, and this was not observed. A test was developed, using a cooked-blood technique in which the normal blood clot is brown when heated. In these cases, the cooked or heated clot turned red which was considered a nitroso reaction (nitrosohemoglobin).

No trouble was observed until the cattle began to eat the cornstalks. Other investigators have reported poisoning when cattle were turned into corn fields, particularly in drought periods when mature stalks had been frosted. However, frost was not a factor in these cases. A spectrographic analysis failed to give any evidence of heavy metals but did show high nitrosohemoglobin. Material examined also proved negative for carbon monoxide.

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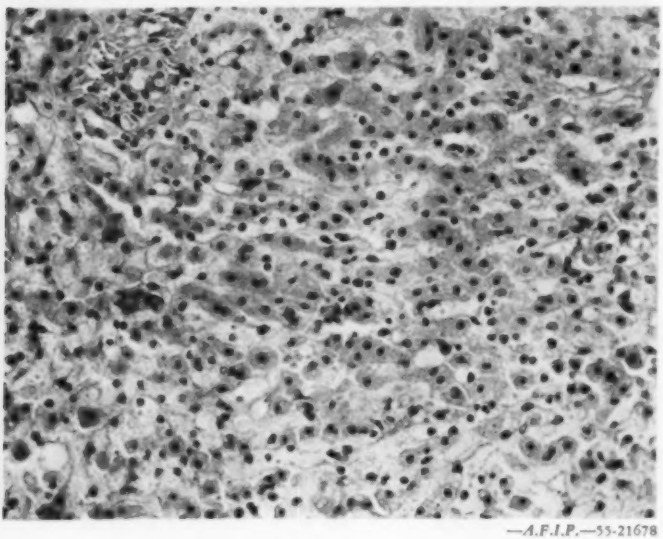

—*A.F.I.P.*—55-21678

Fig. 33—Section of liver of cow with cornstalk poisoning (case 18) showing necrosis of most of the liver cells as indicated by karyorrhexis and pyknosis of their nuclei. x 210.

Drought Area. J. Anim. Sci., *14*, (1955): 1,251.
Case, A. A.: Cornstalk Poisoning. Haver-Glover Messenger, *35*, (1955): 4.

CASE 19—EXPERIMENTAL PRODUCTION AND CONTROL OF BRACKEN FERN POISONING IN RATS—*D. R. Cordy, D.V.M., Ph.D.*

*History.*—Two groups of rats were fed raw bracken fern (*Pteridium latiusculum*).

Case 19 was presented by Dr. D. R. Cordy, Davis, Calif.

Rats in group A, which received raw bracken fern for 40 days, had poor appetites and failed to gain. By the fourth week, they assumed a hunched position and a hesitant, shuffling gait. Frank nervous signs were not observed. These rats became emaciated and listless. Alopecia appeared over the lumbosacral region. Sec-

—*A.F.I.P.*—55-21584

Fig. 34—Section of bone marrow from rat with experimental bracken fern poisoning (case 19), showing atrophy due to bracken fern poisoning. Notice hemorrhage and absence of hematopoesis. H & E stain; x 100.

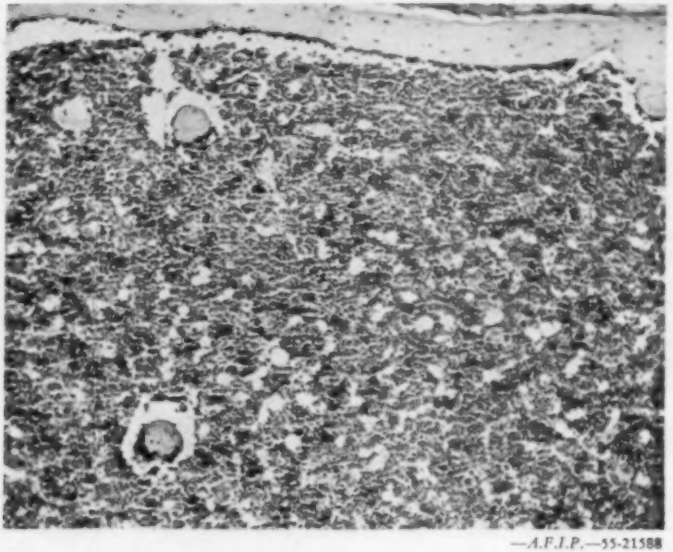

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Fig. 35—Section of normal bone marrow from a rat fed bracken fern and thiamine hydrochloride (case 19). H & E stain; x 100.

tions of bone marrow from the sternum were taken for study.

Rats in group B received the same diet but on the thirtieth day, and on every other day for 14 days, each received 1 mg. of thiamine hydrochloride. Sections of bone marrow from the sternum were taken for study.

*Comments* (Moderator Smith).—The bone marrow from the rats in group A, fed bracken fern only, shows hemorrhage, atrophy, and an absence of erythropoiesis (probably resulting in aplastic anemia) (fig. 34). The sections of bone marrow from rats in group B appear normal (fig. 35); changes were corrected and prevented by the use of thiamine hydrochloride.

*Diagnosis.*—Bracken fern poisoning in a rat, with aplastic anemia.

**Reference**

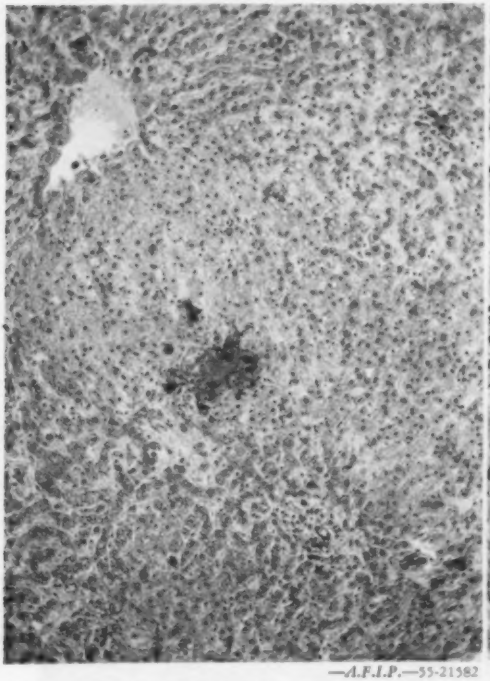
Cordy, D. R.: The Pathology of Experimental Bracken Poisoning in Rats. Cornell Vet., *42*, (Jan., 1952): 108-117.

CASE 20—BRACKEN FERN POISONING IN A COW—*R. F. Langham, D.V.M., Ph.D.*

*History.*—A heifer, 1 year old, was 1 of 5 that had died within a month in a herd that had been pastured in a field containing bracken fern. The affected animals stopped eating, developed temperatures of 106 to 107 F., bled from their nostrils, and raw sores and scabs appeared on their muzzles before they died. Necropsy revealed extensive hemorrhages throughout the body. The surface of the liver showed large, dull-appearing areas 3 to 5 cm. in diameter. Cultures of lung, spleen, and liver were negative for bacteria.

*Comment* (Dr. R. F. Langham).—This poisoning causes a thrombocytopenia which can be detected in stained blood smears. Furthermore, a leukopenia developed as a

Case 20 was presented by Dr. R. F. Langham, East Lansing, Mich.



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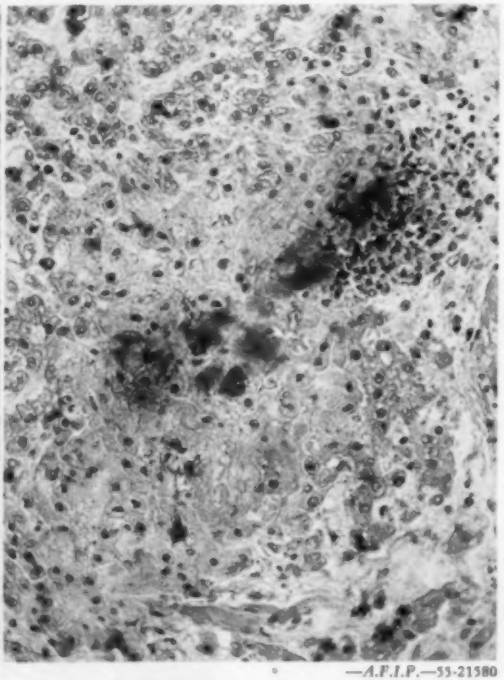


—*A.F.I.P.*—55-21580

Fig. 36 (Left)—A section through the liver of a cow (case 20) with bracken fern poisoning, showing large area of necrosis indicated by pyknosis and loss of differential staining. The darker area is a clump of saprophytic organisms. H & E stain; x 100.

Fig. 37 (Right)—A higher magnification of the section of bovine liver shown in figure 36 (case 20). Colonies of bacteria are surrounded by necrotic liver cells and some leukocytes. H & E stain; x 210.

result of depression of the bone marrow. When aplastic anemia develops, the prognosis is usually unfavorable. Blood transfusions and large doses of thiamine hydrochloride are recommended as treatment. Animals should be removed from pastures which contain bracken fern.

*Diagnosis.*—Bracken fern poisoning in a cow, with focal coagulation necrosis of the liver (fig. 36, 37).

CASE 21—SENECIO POISONING IN CATTLE—*C. L. Davis, D.V.M.*

*History.*—Fifteen Hereford cows, in a herd of 425 that ranged near Colorado Springs, died in March and April after showing signs of hyperesthesia, walking aimlessly in circles as if blind, and pushing against objects. They were anorexic, lost

Case 21 was presented by Dr. C. L. Davis, Washington, D. C.

Fig. 38—Section of bovine liver (case 21) showing hemorrhage, necrosis, and cirrhosis due to Senecio poisoning. H & E. stain; x 75.

—*A.F.I.P.*—55-20739

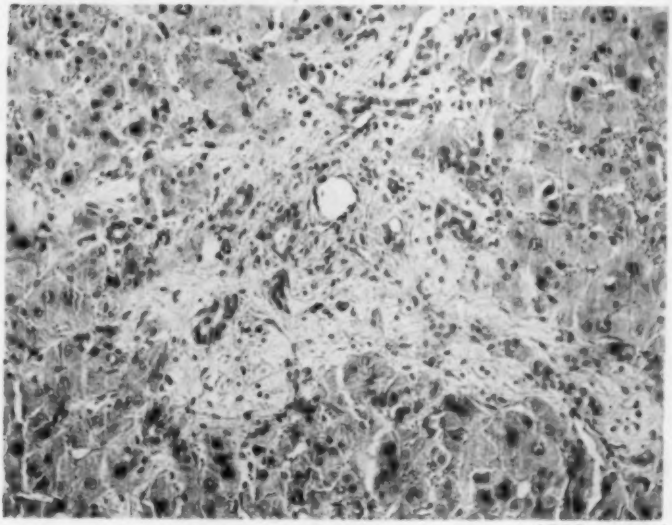


Fig. 39—Higher magnification of same lesions in another area of the liver of the cow with Senecio poisoning (case 21). Early cirrhosis is evident in the portal area and regeneration of liver cells is indicated by their large size and hyperchromatic nuclei.

—*A.F.I.P.*—55-20736

weight, slobbered, had intermittent diarrhea, but showed no fever. At necropsy, the carcasses bordered on emaciation and the livers were mottled with firm gray areas of varying size. Some parts of the liver contained edematous nodules that were raised slightly from the surface. The wall of the gallbladder was thickened and edematous and the bile was viscid. There was serous infiltration of the visceral peritoneum, the fat was slightly yellow, and there were a few hemorrhages on the epicardium and endocardium.

The pastures contained an abundance of Senecio plants with evidence that the cattle had been eating the stems of the previous year's growth, as well as the new shoots. These new shoots of Senecio were the first growths available and new cases of poisoning ceased when other pasture grasses appeared.

*Comment* (Dr. C. L. Davis).—Microscopically, the livers show changes which are a combination of hemorrhage, necrosis, and cirrhosis (fig. 38, 39). The cirrhosis is centered at the portal triad. Hepatic destruction is indicated by areas of necrosis, hemorrhage, and regeneration.

*Diagnosis.*—Senecio poisoning in a cow, with characteristic hepatic necrosis, hemorrhage, and postnecrotic cirrhosis.

CASE 22—CROTALARIA POISONING IN A HORSE—*H. R. Seibold, V.M.D.*

*History.*—A horse in the region of Waterboro, S. Car., developed signs of listlessness, ataxia, anorexia, and wandered aimlessly until it became comatose and died. Encephalomyelitis was suspected and the brain and liver were collected at necropsy and forwarded for examination. The brain was negative for the virus of equine encephalomyelitis but the liver showed marked signs of chronic necrosis and cirrhosis. The horse had had access to crotalaria plants (*Crotalaria sagittalis*).

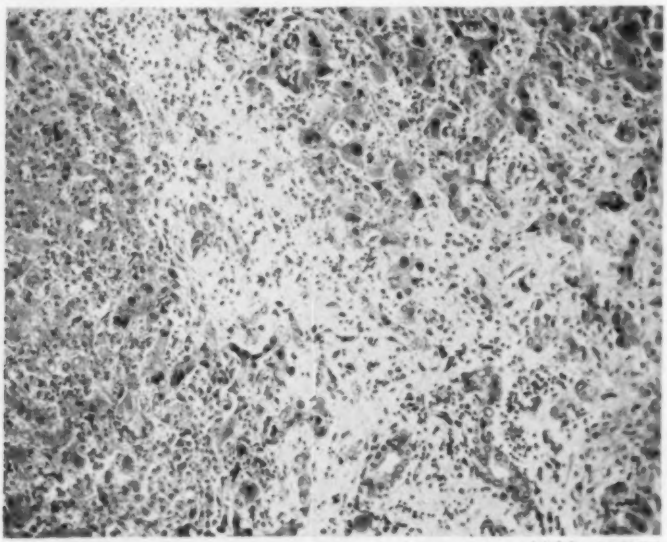
*Comments* (Dr. H. R. Seibold).—The pathological changes in the liver are of chronic necrosis and postnecrotic cirrhosis, a picture identical with the changes caused by Senecio poisoning. It is not known whether the alkaloids in these plants are the same but their action causes the same pathological changes. This disease was first described as "walking disease" in 1929.[1]

*Diagnosis.*—Crotalaria intoxication in a horse, with necrosis and postnecrotic cirrhosis of the liver (fig. 40).

Reference

[1]Van Es, L., Cantrell, L. R., Martin, H. M., and Kramer, J.: On the Nature and Cause of "the Walking Disease" of Northwestern Nebraska. Nebraska Agric. Exper. Sta. Res. Bull. *43*, 1929.

Case 22 was presented by Dr. H. R. Seibold, Auburn, Ala. Dr. Seibold is now at the Animal Disease Laboratory, Plum Island, Greenport, L. I., N. Y.



—*A.F.I.P.*—55-21578

Fig. 40—Section of equine liver (case 22) showing necrosis and cirrhosis due to Crotalaria poisoning. H & E stain; x 100.

## Calcium Versenate in Lead Poisoning

Three cattle, 6 to 18 months old, in separate herds in England, recovered rapidly and completely from lead poisoning after being given a single intravenous treatment of 3 to 6 Gm. of calcium versenate in saline solution. On one farm, 3 other calves had died and the 1 treated had a blood level of more than the normal limit (0.25 mg./ml.) of lead. (A pet donkey on this farm also developed signs of lead poisoning and recovered quickly after treatment.) The cattle showed depression or nervousness, and 2 showed blindness and partial paralysis of the tongue; however, they could chew and swallow feed pushed into their mouths. All were completely normal in three to four days after treatment, except that vision for 1 did not return to normal for about ten days.

The source was not determined but the fact that all recovered after a single treatment and without being given any soluble sulfate orally indicated that they had not ingested massive doses of lead compounds. —*J. R. Todd in Vet. Rec., Jan. 12, 1957.*

## An Analysis of Mastitis

Of the 20 kinds of infection which can cause mastitis, four produce 99 per cent of all cases. They are: (1) *Streptococcus agalactiae;* (2) other streptococci; (3) staphylococci; and (4) bacillary organisms (including coliform and Pseudomonas). Each form can occur in three degrees of severity: nonclinical, negative to barn tests; mild clinical, positive to barn tests; and severe clinical. Thus, four types of infection, each with three degrees of severity, makes it possible to have 12 combinations.

*Streptococcus agalactiae* mastitis is rarely severe, whereas bacillary mastitis is often severe. *Streptococcus agalactiae* mastitis is more or less permanent when untreated, while the bacillary form often disappears completely in a few weeks, *i.e.*, the more severe the clinical signs, the more chance of eventually getting a negative culture without treatment. The habitat of *Str. agalactiae* is limited to the udder and exists in the environment only a short time. It is peculiarly vulnerable to penicillin so, if the incurable cows are sold, this infection can be eradicated from a herd.

There is no acceptable evidence that the eradication of *Str. agalactiae* leads to a greater incidence of the other forms of mastitis. In the other three infection forms, the habitat of the organism is in the environment and their mode of infection is not fully understood.

Laboratory culturing may be started in three ways: (1) by refrigerating the unaltered milk samples until they are cultured; (2) by incubating unaltered milk until examined or cultured; and (3) by incubating the milk sample with chemicals added to prevent growth of unwanted bacteria. Only the first can be used for diaging all forms of the disease.

The present antibiotic preparations for treating mastitis may be about as good as they will ever be; they help to control infection, but treating only cows with clinical cases can never eliminate infection from a herd. While the *Str. agalactiae* form of mastitis can now be eradicated, much research will be necessary before this will be possible with the other forms.— —*James M. Murphy, V.M.D., in J. Dai. Sci., Dec., 1956.*

## Types of Staphylococci in Mastitis

To determine the significance of the hemolytic staphylococci isolated from milk samples, several dairy herds in Ontario, Canada, were investigated using bacteriophage methods of typing. The mammary glands (quarters) were classified as "normal" when there was no history of infection; as "chronic" with a history of abnormal secretions or induration; or as "acute" when severe inflammation, systemic reaction, or gangrene were present. The gland status was considered as "negative" when no organisms were found; as "carriers" when organisms were present without an increase in leukocytes; and as "positive" when both organisms and an increase in leukocytes were found.

*Streptococcus agalactiae*, found in one herd, were eliminated with antibiotic therapy. The next year, 30 per cent of the glands yielded hemolytic staphylococci and 38 per cent of the quarters were classed as positive. Neither autogenous bacterin nor sporadic antibiotic therapy was beneficial. All strains isolated were of phage group A. After a year of regular antibiotic therapy, 23 quarters of the 16 cows had continuously been free of organisms; 26

quarters had remained continuously infected; 10 infected quarters had become negative; and five negative quarters had become carriers. However, 5 cows were sold because they did not respond to therapy. The younger animals remained negative.

In four of the seven herds studied, only group A Staphylococcus was found; in one herd, group B Staphylococcus was also present. The staphylococci isolated from a gangrenous gland did not differ in phage group from those isolated in carriers. Infection was more prevalent in older cows, and heifers in these herds gradually became infected with the same phage group. The organisms were isolated from the milking equipment before milking, and were not affected when the equipment was dipped in a chlorine solution (100 p.p.m.) for ten seconds between cows.

On plate tests, all strains of staphylococci were equally sensitive to antibiotics commonly used. The effectiveness of antibiotic therapy seems to depend on the condition of glands and the duration of the infection. Of the 591 strains of hemolytic Staphylococcus isolated, 81.2 per cent could be classified into five of the possible 42 groups. Each of the five phage groups was found in normal and chronic, as well gangrenous, glands.—*D. A. Barnum and D. S. Fuller in Canad. J. Comp. Med., May, 1956.*

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*Bovine Mastitis and Swine.*—To discover the possible source of group L streptococcic mastitis in cattle in Norway, 1,035 inoculations were made with material from several species of animals. The organism was recovered from the skin and pharynx of man and from the skin and pharynx, but particularly the mucous membrane of the vagina (26.9%), of swine. How these streptococci are transmitted from swine to cattle is being investigated.—*Sven J. Olsen in Nord. Vet.-med., Jan., 1957.*

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## New Method of Milk Pasteurization

There is an increasing interest in pasteurizing milk with a shorter heating time, the lethality depending upon the quick rise and fall of the temperature. It had been found that at about 160 F., organisms were killed as rapidly in chocolate milk as in whole milk whereas, at lower temperatures, it required longer. Also, that pasteurization at 168 F., with a holding time of 2.36 seconds, was as effective as 123 F. for 30 minutes. In the new process, the milk is forced through small-bore (7/64-inch inside diameter) stainless steel tubing by air pressure, and heated by electrical resistance.

Using the extremely short heating time of 0.25 second and a holding time estimated at only 0.05 second, all of six common organisms tested, in a concentration of 1,000,000 organisms/ml., were completely killed at 175.6 F. A heating time of 0.25 second at 183 F., or of 0.5 second at 181.5 F., was found comparable to 143 F. for 30 minutes. Since phosphatase is inactivated at 182.4 F. with a heating time of 0.25 second, it can still be used as a satisfactory indicator of the effectiveness of this method of pasteurization.—*J. Dai. Sci. (Jan., 1957): 29-36.*

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*To Study Penicillin in Milk.*—Since a survey in 1956 showed that 6 per cent of milk samples contained traces of penicillin, and since approximately 10 per cent of our human population is highly sensitive to penicillin, such milk could cause serious reactions. While no authentic cases of reaction to penicillin in milk have been recorded, the Food and Drug Administration, using highly sensitive human volunteers, will make a study of this problem.—*Hoard's Dairyman, Jan. 25, 1957.*

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## Veterinarians and Certified Herds

The veterinarian on the certified milk farm is responsible for constant supervision of the animals from birth until final disposition. "For this reason, certified herds have maintained a reputation for superiority and excellence in the production of . . . quality milk . . . ." The veterinarian must make frequent inspections; a thorough, monthly physical examination of each animal; monthly reports; regular health tests; report disease immediately.

In certified herds, the cow must be excluded from the milk line 45 days before and five days after calving. Also, in addition to strict sanitation, the herd must be isolated so that horses, hogs, dogs, and fowl can not come near them. No cow with a nonfunctioning quarter may be used for milk production until it is surgically treated. These are but part of the standards established by the American Association of Medical Milk Commissions.—*Certified Milk, Jan., 1957.*

Fig. 1—The Four Corners Veterinary Hospital, Concord, Calif.

# A "Macro"-Hospital in a "Micro"-Space

LAWRENCE M. PROCTER, D.V.M.

*Concord, California*

The Four Corners Pet Hospital in Concord, Calif. (fig.1), was planned to provide sufficient space and enough separate rooms and wards for the efficient operation of a hospital although it has only 1,344 sq. ft. of floor space. It includes a reception room, private office, examination room, laboratory, surgery, kitchen, bedroom, bath and darkroom, and four wards with 22 cages (fig. 3).

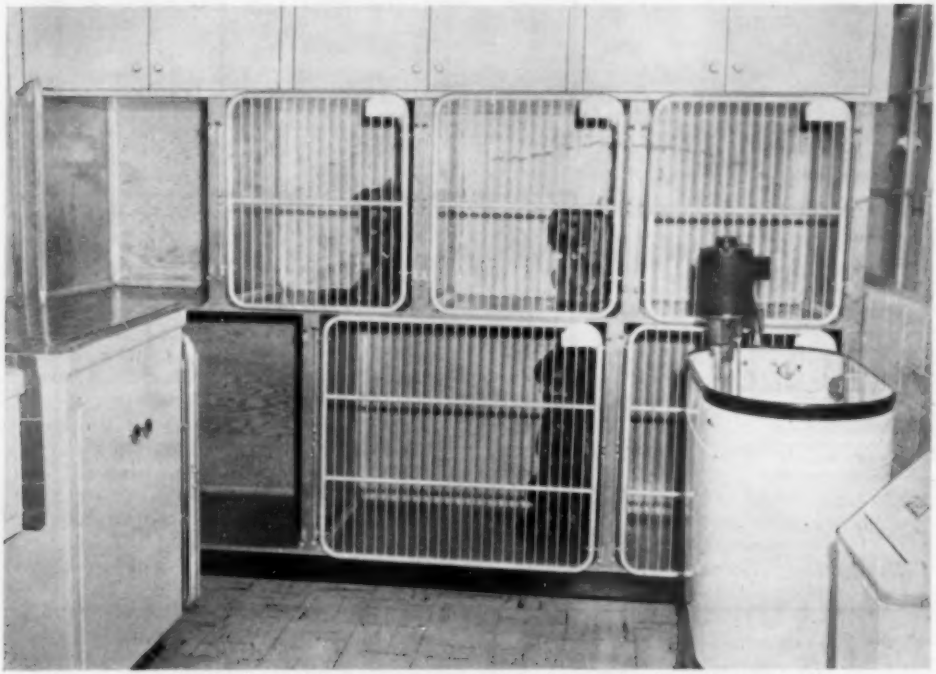

Fig. 2—A ward in the hospital showing cages constructed of plywood with aluminum gates. The area directly above the cages is enclosed to provide storage space.

The generous halls provide for efficiency of operation and economy of personnel, one veterinarian, and a nurse.

Thirty-four linear feet of wall space is provided for double-tiered banks of cages in four wards. Storage space is provided by installing simple face frames with doors from cages to the ceiling (fig. 2).

Additional space and laborsaving features include a divider between the laboratory and the examination room consisting of a ceramic tile-topped cabinet with sink, drawers, and storage area and, above these, a hanging drug cabinet which can be reached from either side (fig. 4). This also makes it possible to do some laboratory work in full view of the client, a desirable procedure, without him being in the way.

The x-ray machine is mobile and easily moved on rollers to the place where it is needed. The small wards make better control of unexpected infections possible, and provide an isolation ward with an entrance to the parking lot separate from the entrance to the wards for other patients.

The phone behind the receptionist's desk can be reached through a sliding glass window from either the examination room or the private office.

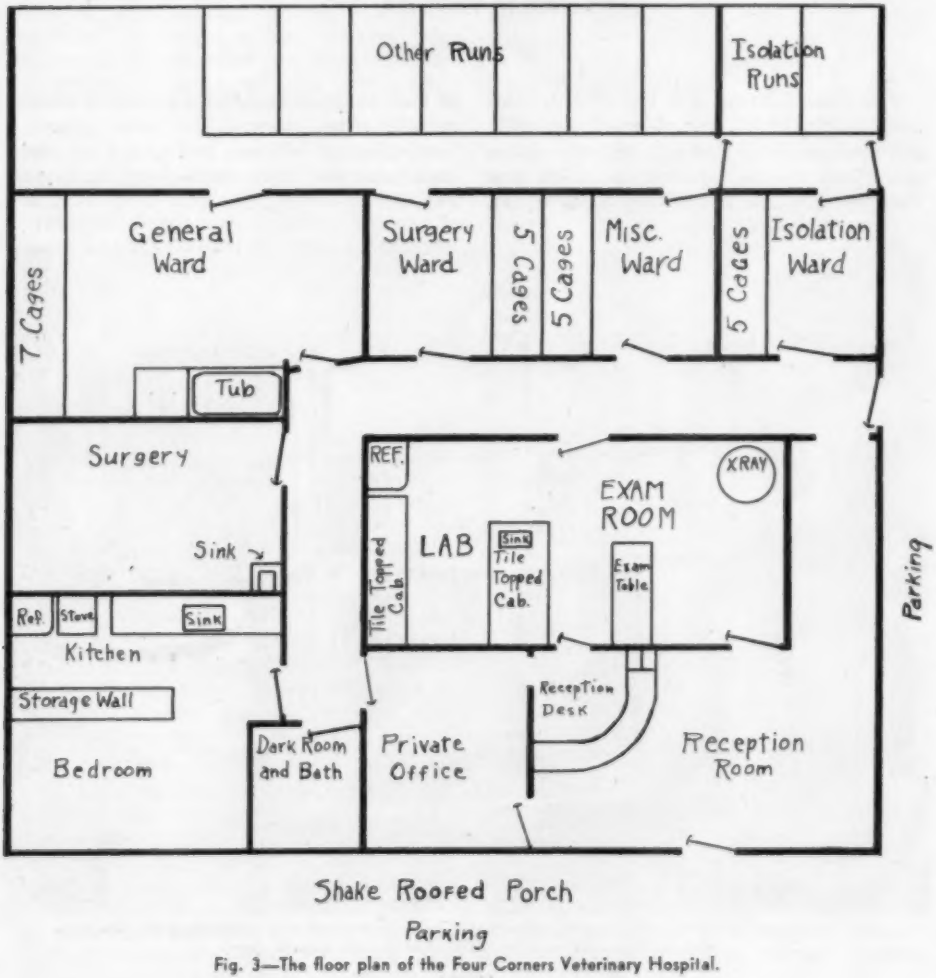


Fig. 3—The floor plan of the Four Corners Veterinary Hospital.

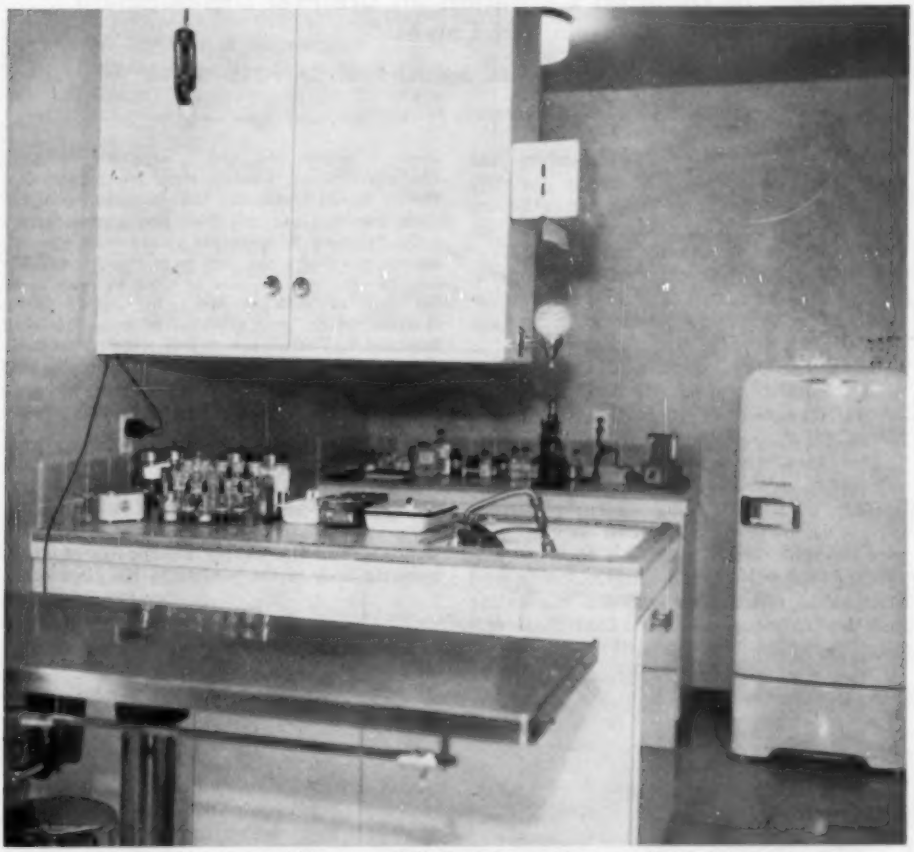

Fig. 4—Examination room and laboratory of the Four Corners Veterinary Hospital showing the hanging drug cabinet.

Ceramic tiles were used around the tub and sinks. A "lift-for-shower" type of plumbing fixture was used on the tub for filling the enema jar, eliminating the usual pulley arrangement. A storage wall divider separates the kitchen and bedroom.

The 8-ft. porch in front, with its low ceiling, keeps out the afternoon sun and the outdoor runs are covered with yellow corrugated plastic which protects against the sun and weather. The building is of cement block construction, with well-insulated roof and walls, which maintain a pleasant temperature even on hot days.

There is radiant heating in the cement floors and the surfaces are covered with vinyl tile. The bath has a pullman sink with a built-in developing tank for use as a darkroom. Nine runs are provided and each ward opens directly into its runs. Permission to build on the property line was obtained by making that wall of cement block with no windows. This allows space on the other side of the building for considerable parking. If expansion becomes necessary, the private office could easily be converted to another examination room and more wards could be added at the rear.

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A Holstein-Friesian cow in Illinois recently set a new all-time high fat-production record—1,523 lb. of butterfat from 38,817 lb. of milk, an average of 106 lb. of milk per day for 365 days. The national milk record for this breed is 42,805 lb. in 365 days.—*Progress. Farmer, Feb., 1957.*

# Effect of Deferred Castration on Urethral Development in Calves

HADLEIGH MARSH, D.V.M., and JOHN W. SAFFORD, D.V.M.

*Bozeman, Montana*

DEFERRED CASTRATION of bull calves has been proposed in Montana, in the past five years, as a method of decreasing the incidence of occluding urinary calculi in steer calves during their first winter.

It is the usual practice of cattle operators in this area to brand and castrate in the spring or early summer, when the calves vary in age from 2 weeks to 2 months. Deferred castration, which has been tried with apparently good results on several ranches, is castration when the calves are about 6 months old.

The idea of deferring castration developed from the observation that the percentage of the incidence of clinical urolithiasis is lower in bulls than in steers. It was thought that the reason for this difference might involve physiological and anatomical differences between the entire and the castrated male, and that those differences might be reduced by late castration.

Anatomically, the sigmoid flexure of the penis of cattle constitutes a basic hazard because solid particles suspended in the urine would have a greater tendency to become lodged than if the urine were passing through a straight tube. A high percentage of occluding calculi are found in, or just distal to, the second curve of the sigmoid flexure, near the attachment of the tendon of the retractor penis muscle.

Another factor is the probability that the lumen of the urethra has a greater diameter in bulls than in steers and in late as compared with early castrated animals. To determine whether such a difference in urethral development actually occurs, the following experimental investigation was made.

## EXPERIMENTAL PROCEDURE

Nine Hereford calves were used in the experiment: 3 of them were castrated when they were not more than 1 month old, 3 when they were about 7 months old, and 3 were not castrated. The experimental animals were selected on November 4, which was the date of castration of the older calves. Their only feed was a grass hay.

On February 9, when the calves were approximately 10 months old, they were slaughtered. The date of slaughter was set as close as possible to the date of peak incidence of urolithiasis in Montana which, over a period of years, has been February 1. The urinary organs were immediately removed from each animal. After each urethra was filled with liquid latex, the penises were immersed for 24 hours in a solution containing 10.0 per cent formalin and 0.5 per cent acetic acid. This solution fixed the tissues and hardened the latex without any shrinkage. The latex cast of the urethra was removed after splitting the urethral wall throughout its length.

The diameters of the latex casts were measured with a micrometer caliper at intervals of 4 cm. from the neck of the bladder to the glans penis.

## RESULTS

The diameters of the latex urethral casts are shown (table 1). The first item in each column is the diameter just distal to the neck of the bladder, the last item is the diameter at the external orifice, and the item marked with an asterisk is the diameter at the apex of the first curve of the sigmoid flexure. In general, there is a gradual decrease in diameter from the proximal end of the urethra to some point in the sigmoid flexure. In 2 of the bulls and 1 of the late-castrated calves, the minimum diameter is reached at the apex of the first curve, while in all the early-castrated calves, the minimum diameter is reached only in the second curve and distal to that curve.

The average of all the measurements of the bull casts was 6.6 mm.; the fall-castrated calves, 6.0 mm.; and the spring-castrated calves, 5.2 mm. Of more significance is the comparison between the averages of the smallest diameters in the 3 animals in each group. These averages were 5.08 mm. for the bulls, 4.0 mm. for the fall-castrated, and 3.53 mm. for the spring-castrated calves.

There was also a difference in the average length of the urethras. For the bulls, it was 62 cm.; for the late-castrated

From the Montana Veterinary Research Laboratory (Montana Experiment Station and Livestock Sanitary Board cooperating). Dr. Safford, now at Helena, is state veterinarian of Montana.

Agricultural Experiment Station, Montana State College, Bozeman, journal series paper No. 399.

calves, 52 cm.; and for the early-castrated calves, 44 cm. The bulls weighed 45 lb. more at the start of the experiment than the fall-castrated calves and 50 lb. more at the finish, which may have accounted for part of the difference in dimensions of the urethra. The late-castrated calves were slightly heavier at the finish than those castrated early but the difference in length of the urethra was 19 per cent, while the difference in weights was only 3 per cent.

A photograph (fig. 1) shows the latex cast from each group, the measurements of which were the nearest to the average for that group. The casts retained a tendency to assume the position indicating the sigmoid flexure. In each case, the apex of the proximal curve is properly located in the photograph. The pointers are directed to the points where the minimum measurement (table 1) was first reached: for bull 197, it (5.25 mm.) was at the apex of the first curve and this minimum diameter extends for a distance of about 8.0 cm.; for the fall-castrated steer 196, it (4.0 mm.) was found in the second curve near the attachment of the retractor penis muscle; and for the spring-castrated steer 191, it (3.5 mm.) was at a similar point and extended for a distance of 8.0 cm.

TABLE 1—Diameters, in Millimeters, of Latex Urethral Casts of Calves Taken at Intervals of 4 Cm. from the Neck of the Bladder to the External Urethral Orifice

| Bulls | | | Fall-castrated calves | | | Spring-castrated calves | | |
|---|---|---|---|---|---|---|---|---|
| 199† | 194 | 197 | 198 | 196 | 200 | 191 | 188 | 190 |
| 10.5 | 9.25 | 10.5 | 10.0 | 8.5 | 8.2 | 9.5 | 7.75 | 9.5 |
| 9.5 | 7.0 | 10.5 | 8.0 | 8.25 | 8.0 | 9.0 | 8.0 | 6.2 |
| 10.5 | 7.0 | 9.5 | 6.5 | 7.0 | 6.0 | 6.5 | 7.0 | 5.0 |
| 9.0 | 6.0 | 8.25 | 6.0 | 5.75 | 5.2 | 6.0 | 6.0 | 4.5 |
| 8.0 | 6.0 | 7.5 | 6.0 | 5.25 | 5.0 | 5.0 | 5.0 | 4.0 |
| 7.0 | 6.0 | 7.25 | 5.5 | 5.25 | 5.0 | 5.0 | 5.0 | 3.75* |
| 6.5 | 5.5 | 6.75 | 5.25 | 5.25 | 4.2 | 4.0 | 4.75 | 3.5 |
| 7.0 | 5.0 | 6.5 | 5.0 | 4.75* | 4.0* | 4.0* | 4.25* | 3.4 |
| 5.5 | 4.75* | 6.0 | 5.0 | 5.0 | 3.75 | 3.5 | 4.0 | 3.4 |
| 5.5* | 5.0 | 5.25* | 4.25* | 4.0 | 3.75 | 3.5 | 3.7 | 3.5 |
| 6.0 | 5.0 | 5.25 | 4.5 | 4.25 | 4.2 | 3.5 | 3.75 | 3.5 |
| 5.5 | 5.0 | 5.25 | 5.0 | 5.0 | 5.2 | 6.0 | 3.75 | ---- |
| 5.25 | 5.0 | 5.5 | 5.5 | 7.0 | 7.5 | ---- | 7.0 | ---- |
| 5.5 | 5.25 | 6.0 | 8.5 | ---- | ---- | ---- | ---- | ---- |
| 5.25 | 5.5 | 6.0 | ---- | ---- | ---- | ---- | ---- | ---- |
| 6.25 | 6.0 | 7.0 | ---- | ---- | ---- | ---- | ---- | ---- |
| 8.5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

*First curve of sigmoid flexure. †Animal's number.

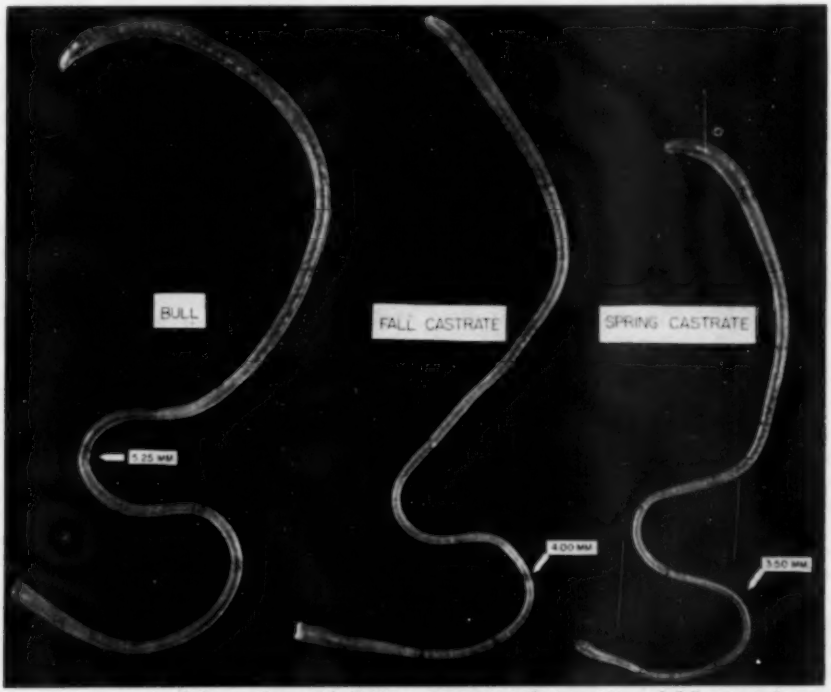


Fig. 1—Latex casts of the urethras of bull 197, spring-castrated steer 196, and fall-castrated steer 191. Pointers indicate minimum diameters.

### DISCUSSION

Whether the difference in the diameter of the lumen of the urethra between early- and late-castrated calves is an important factor in the incidence of occlusion of the urethra by calculi, we do not know. However, on the basis of the averages of the minimum diameters, a fall-castrated calf could pass a stone 13 per cent greater in diameter, and a bull could pass a stone 44 per cent greater, than could be passed by a spring-castrated calf.

### CONCLUSION

Measurements of the diameter of the lumen of the urethra in steer calves, 10 months old, castrated at the age of 1 month, calves castrated at 7 months, and bulls of the same age show differences which may be a factor in the observed lower incidence of clinical urolithiasis in bulls and late-castrated steers as compared with steers castrated when very young.

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## Prevention of Vaginal Prolapse in the Cow

The author believes that a deficiency of vitamin $B_1$ is a factor in displacement of the vagina, but gives no supporting evidence for this theory. He discusses two kinds of vaginal displacement, cranial and caudal. Cranial displacement into the abdominal cavity, considered a cause of sterility, is seldom diagnosed.

Caudal displacement or prolapse is corrected by two methods. The first makes use of linen bandage sutures crossed over the vulva. The upper end of each suture is passed through incisions in the skin halfway between the tuber ischii and the tailhead. The lower ends are passed through skin incisions on the back of the thigh, 8 inches below the tuber ischii. Each suture is tied separately at the upper end.

The second method requires epidural anesthesia. The vagina is washed and the points of suture swabbed with tincture of iodine. A large needle is threaded with heavy double suture material or narrow bandage. A roll of bandage is tied to the end of the suture as an anchor and the needle is passed from the inside of the vagina out through the lesser sciatic foramen, which is easily palpated, and through the muscles and skin. The outer end of the suture is tied around another roll of bandage. This is repeated on the opposite side. The sutures are removed in 12 days. If the sutures are placed in the last few days of gestation they are not removed for parturition; they do not interfere. In 1 cow, when the sutures were left in place for six months, pus formed at both ends of the sutures, but there were no serious complications.—[*Prof. Peter Minchev, Sofia Veterinary Inst. Bulgaria: The Use of a New Surgical Method in Eversion and Prolapse of the Vagina in Animals. Veterinariya, 33, (Nov., 1956): 58-60.*]—ROBERT E. HABEL.

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*A Modified Operation for Vaginal Prolapse.*—Minchev's method (above) of anchoring the vagina to the pelvic wall has been used in a modified form at the Veterinary College in Ghent, Belgium, for several years. The vagina is cleaned and treated with an ointment containing tyrothricin and nitrofurazone. The suture will not go through the lesser sciatic foramen but just behind the sacroiliac joint. [Translator's note: It apparently passes through the sacrosciatic ligament above the greater sciatic foramen and between the second and third sacral nerves.] The rectum must be protected by pushing it to the other side with the hand in the vagina. The caudal uterine and hypogastric arteries must also be avoided, but they are easily palpated and the suture is passed dorsal to them.

Stainless steel wire is tied around a roll of bandage, and the two ends of the wire are carried into the vagina. Then a small trocar is passed from the outside through the skin and gluteal muscle into the vagina, guided by vaginal palpation. The wires are pushed out through the cannula which is withdrawn and the wire is tied around another roll of bandage on the outside. This is repeated on the opposite side. The sutures are removed after adhesions have formed, usually in 12 days.

The authors have used the Farquharson operation on 57 cows with vaginal prolapse. Two of these died or were killed as a result of surgery, and 16 could not be checked later. Of the remaining 39, prolapse recurred in 18, 11 have successfully passed through a gestation, and 10 still had not reached late pregnancy at the time of the report.

The results were better with 40 cows

treated by Minchev's method. In 2 cows, the suture pulled out on one side; prolapse recurred in 6 when the sutures were removed, in 3 at estrus, and in 4 in late pregnancy; and 25 were satisfactory.—[*J. H. Bouckaert, W. Oyaert, H. Wijverkens, and E. van Meirhaeghe: Prolapsus vaginae bij het Rund. Vlaams Diergeneesk. Tijdschr., 25, (1956): 119-132.*]—ROBERT E. HABEL.

## Fetal Fluids in Ruminants

During a six-year period while abattoir material was collected for classwork in England, measurements were made of the allantoic and amniotic fluids and of the body length of the fetus in the pregnant uteri of 71 cows and 26 ewes. In both species, the total fluid increased steadily throughout pregnancy, except for a slight decrease at the end of the period in ewes. In both, there was usually more allantoic fluid than amniotic fluid during the first third of pregnancy, more amniotic than allantoic fluid during the second third, while in the last third of pregnancy the allantoic fluid again was clearly in excess.

The total fluids in the cow increased sharply between six and nine weeks, between three and one-half and four months, and between six and one-half and seven months; the first and last sharp rise was due to an allantoic fluid increase and the second rise due to amniotic fluid increase. Each of these periods coincides with known hormonic developments (the first with the time of placental attachment, the second with descent of the testicles in the male, and the third when the fetus becomes independent of the corpus luteum).

During the study, 4 cases of so-called "hydrops amnii" were encountered in cows, 2 antemortem and 2 postmortem, and all were during the last two and one-half months of gestation. All were carrying female fetuses, although 1 was a freemartin twin of a male. The uterus of the cow with the youngest fetus (6.5 mo.) contained 4 gal. of total fluid, three times the normal amount. An attempt was made to save the second animal, a heifer seven months' pregnant, by cesarotomy. Her uterus contained little amniotic fluid but about 20 gal. of allantoic fluid. When she died, seven days later, the uterine wounds had healed but there had been little involution of the thin walled uterus.

The cow carrying twins was killed, since she was *in extremis* as parturition started. Again, there was little amniotic fluid but about 50 gal. of allantoic fluid. The fourth cow died suddenly as parturition time approached. Her uterus was the only one which contained excessive amniotic fluid (8 gal.) but there was a greater excess of allantoic fluid (32 gal.).

There has long been a controversy as to the relative role of the fetus and dam in contributing to normal or excessive fetal fluids. The rate of passage of fluid depends primarily on the permeability of the maternal placenta and that permeability is known to be influenced by steroid hormones and inflammatory processes. Of the 4 cases reported, there was caruncular necrosis of the maternal cotyledons in 3, but edema of the fetal membranes in only 1, supporting the previous preponderance of evidence that the dam is responsible. Also, all of the fetal kidneys were grossly normal except one which showed advanced hydronephrosis; it was three times the normal size and consisted of a 2-ml. thick shell of renal tissue surrounding the dilated calyces and pelvis. It is suggested that this hydronephrosis could be due to reverse pressure, through the urachus, of the excessive allantoic fluid.

There was no infection. It is suggested that incompatibility between the tissues of the fetus and the dam could be an important etiological factor. A hormone factor is also suggested by the fact that hydramnios is usually manifested at the third or fourth month of pregnancy when the amnionic fluid is normally increasing rapidly, whereas hydrallantois, as found in these cows, usually appears first at the sixth to seventh month of gestation when the allantoic fluid is normally increasing rapidly. The condition in late pregnancy called "hydrops amnii" should be termed "hydrallantois."—*G. H. Arthur in Brit. Vet. J., Jan., 1957.*

*Prenatal Growth of Litter Mates.*—Of 485 embryos found in 73 albino mice, 247 were in the left horn and 238 in the right. In 12 uteri, there was an equal number in each horn, but in five, all embryos were in one horn. In 25 females, 78 embryos faced the vagina, while 63 faced the ovary. Where at least twice as many embryos were in one horn as in the other, the average weight of those in the horn with the

smaller number was greater. Embryos nearest the ovary tended to weigh less than the others. These intrauterine environmental differences seemed to have some effect on postnatal growth.

Reference is made to 70 guinea pig embryos, 59 of which faced the vagina. Also rabbit embryos nearest the ovaries weighed less than the others.—*Tohoku J. Agric. Res. (Japan), March, 1956.*

## Bovine Leptospirosis and Abortion

Most investigators agree that leptospiral abortion occurs usually in the last trimester of pregnancy and may be the only clinical sign of infection. Most also believe that fetal death is primary and the abortion is merely the expulsion of a foreign body.

When 21 healthy heifers were inoculated with six strains of Leptospira, including *pomona*, leptospiremia was demonstrated in only 2 and leptospiruria in none, nor were leptospiras found in the kidneys of 6 which were slaughtered between 45 and 95 days after inoculation. Fever (about 1 F.) occurred in 10 of the 13 animals in which temperatures were recorded, starting the third to sixth day and lasting one to six days; 4 showed inappetence and 1 a concurrent depression. Two aborted in 23 and 28 days, and neither leptospiras nor other microorganisms were demonstrated in any of the fetal material, nor were agglutininlysins present. The fetal cotyledons in both cows were moist, atonic, uniformly light fawn, without any blood color, while the intercotyledonary membrane was grayish white with a diffuse, clear edema up to 2 cm. thick.

Neither the interval of three weeks between signs of acute infection and abortion, nor failure to demonstrate Leptospira in the fetal material argue against the assumption that abortions were due to leptospirosis. It is probable that if a fetus becomes infected during maternal leptospiremia, there will be an incubation period of a week or more before the fetal disease is acute. Since the severity of leptospiral infection in calves is inversely proportional to the age, an infected fetus could be expected to die in a few days but not be expelled for another day or two. Leptospiras may not survive the autolysis in the fetus.

The calves born at term showed no signs of infection nor of seroreaction at birth. Shortly after nursing, antibodies appeared in their serum but the number soon declined, indicating that the seroreaction was due to colostral antibodies and not to infection. It was concluded that leptospiral bovine abortion is most often due to fatal leptospirosis of the fetus. Probably less than 3 per cent of Danish bovine abortions are due to leptospirosis.—*K. L. Fennestad and C. Borg-Petersen in Nord Vet-med., 1956.*

## Portable Semen Fertility Gauge

A field kit to test the fertility of stallion semen has been developed by the Southwest Foundation for Research and Education, Lexington, Ky. It indicates the level of a sulfur-containing compound (SH) which, if it is above 10 $\mu$g. per cubic centimeter, has an inhibiting effect on the motility of the spermatozoa. Since the SH level varies from day to day, the tests must be made at the time of service. The kit, which indicates SH content somewhat as litmus paper indicates acids and bases, can test five semen samples simultaneously in about 30 minutes. The laboratory is also investigating whether the thyroid plays a part in reproduction and whether ergothioneine, one of the sulfur-containing compounds in semen, could have an influence on thyroxin production, thus affecting metabolism of body cells and spermatozoa.—*Blood Horse, Feb. 2, 1957.*

*Frozen Epididymal Horse Semen.*—The testicles of 2 Belgian stallions were obtained right after castration and the epididymal fluid was routinely diluted and frozen. Thirteen days later, a mare was inseminated, on her third day of estrus, with the semen of the 3-year-old; she did not conceive. Semen from the 2-year-old was used to inseminate 7 mares 32 days after it was recovered. One mare conceived and foaled normally.—*Canad. J. Comp. Med., Feb., 1957.*

*Ectopic Pregnancy in a Goat.*—During a routine slaughterhouse inspection in India, a three- or four-month mummified fetus was found encased in the peritoneal membranes of a goat. It was attached to the intestines on the right side of the duodenal mesentery. The uterus appeared to be normal.—*Indian Vet. J., Nov., 1956.*

# A Method of Producing Controlled Automatic Inhalation Anesthesia

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*Wright-Patterson Air Force Base, Ohio*

THE NEED for an apparatus capable of creating controlled artificial respiration as well as delivering various inhalant anesthetics has been well substantiated in the veterinary literature.[1-9] Comben[2] reviews the indications for thoracotomy in veterinary surgery and mentions such conditions as diaphragmatic hernia, foreign bodies in the thorax, including the thoracic portion of the esophagus, thoracic neoplasms and granulomas, and canine filariasis as diseases which may be amenable to surgical treatment. The advantages of inhalation anesthetics in certain cases involving aged patients and in cesarotomy has also been well described. A variety of experimental thoracic surgical procedures further creates the need for adequate methods of anesthesiology. As a result of such requirements at the Aero Medical Laboratory, the apparatus shown (fig. 1) was designed for animal use. Its versatility and ease of operation would seem to justify its use in clinical surgery.

Seeler and Good[10] described their automatic resuscitator, pointing out its wide range of adaptability. This instrument is capable of producing graded positive pressures of 0 to 20 mm. of mercury, negative pressures of 0 to 8 mm. of mercury, and variable flow of 0 to 23 liters per minute. Any combination of pressures and flow rate between these extremes may be used. For example, negative pressure may be reduced to zero and, thereby, a functional, intermittent, positive device or the negative cycle may be used to produce alternating positive and negative cycles. The cycle of this apparatus may be manually interrupted at any time to create sustained positive or negative pressure. Thus, the negative cycle may be used as an aspirator for tracheal and bronchial fluids and sustained positive pressures may be used to inflate collapsed lungs. The resuscitator may be operated using any source capable of delivering a pressure of 35 mm. of mercury at its inlet. High pressure oxygen tanks with reduction valves, compressed air, and the exhaust from a household vacuum cleaner motor have all been used successfully to operate the machine.

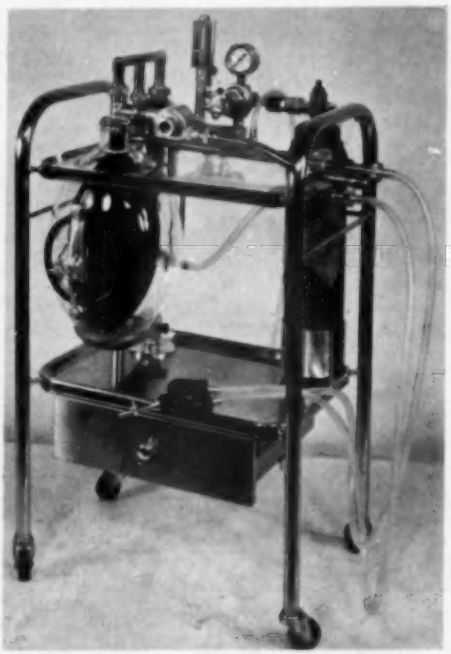

Fig. 1—Photograph of an apparatus for anesthetizing animals for thoracic surgery.

The resuscitator may be used alone for chest surgery when intravenous anesthetics are used. It is attached directly to the endotracheal tube with cuff to supply artificial respiration.

In 1955, Seeler developed an assistor for controlled automatic respiration (fig. 2). This device was designed to automatically squeeze the anesthesia bag in surgical procedures (in man) of long duration where fatigue of the anesthetist's hand reduces the sensitivity of hand bagging. The assistor employs the afore-mentioned resuscitator in creating alternating positive and negative pressures within a closed sphere

From Wright-Patterson Air Force Base, Ohio.

containing the anesthesia bag. During one complete cycle, the resuscitator first creates a positive pressure within the sphere which causes emptying of the bag; then, during the negative phase of the cycle, the bag is refilled. The pressures applied to the anesthesia bag are regulated by adjustment of the positive and negative pressures of the resuscitator. The rate of respiration is controlled by the rate of inflow of the resuscitator. Figure 2 diagrammatically shows the development of these two basic components into a complete closed-system anesthesia machine designed for use with the usual endotracheal tube and cuff. Oxygen may be used with ether or with any combination of other gases, including carbon dioxide, or the device may be used alone when intravenous anesthetics are used.

This machine has been used successfully in approximately 20 thoracic surgical procedures, using animals which varied in size from 80-Gm. hamsters to large dogs weighing 20 to 25 kg. The resuscitator was used alone, prior to the development of this apparatus, over a period of five years without requiring maintenance or repair.

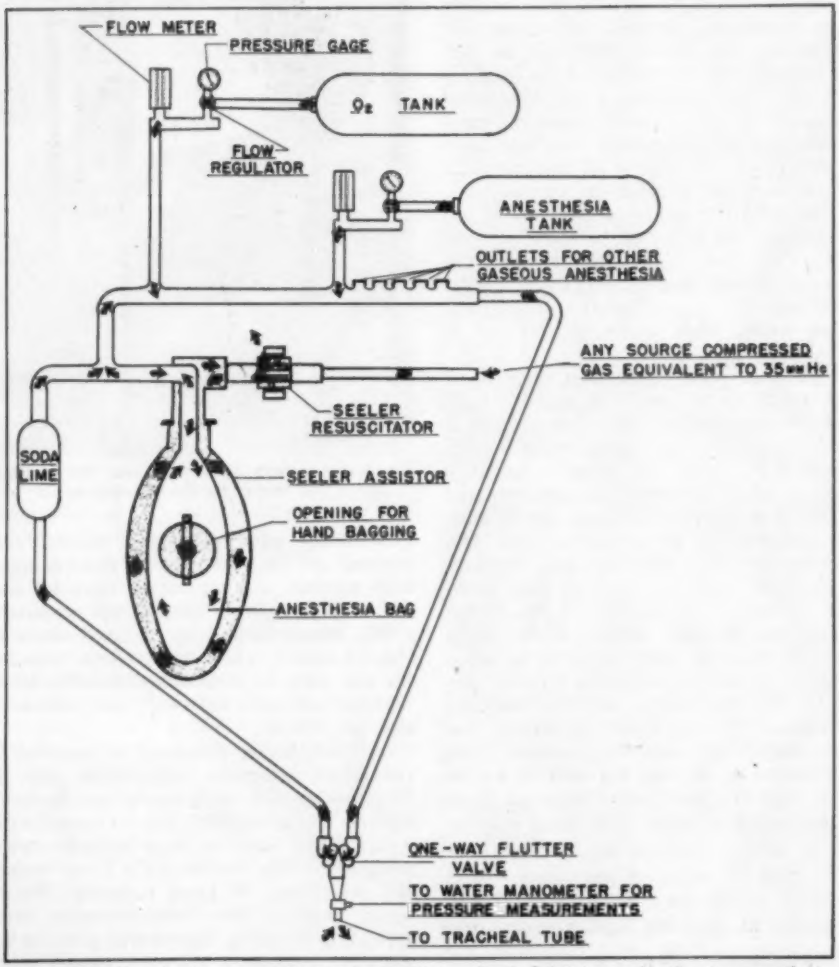


Fig. 2—Diagram showing an assistor and resuscitator developed into a closed-system anesthesia machine for controlled automatic respiration.

SUMMARY

A method of producing controlled automatic respiration and anesthesia in a wide variety of sizes of animals is described. The apparatus used was modified for animal use from an existing resuscitator and assistor.

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*Fracture of the Os Penis in a Pup.*—A Sealyham Terrier, 6 weeks old, was found to have a fracture at the middle of the os penis which closed the urethra. The bone fragments were aligned and urethrotomy was performed in the ischial region. The urethral mucosa was sutured to the skin on each side with fine nylon. The sutures were removed on the sixth day. By the fourteenth day, the opening had closed, the pup was urinating normally, and it recovered fully.—*Vet. Rec., Jan. 5, 1957.*

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*Immunizing Sheep Against Vibriosis.*—Oral inoculation of nonpregnant ewes was found, at the Colorado School of Veterinary Medicine, to immunize them against vibrionic abortion for at least a year. Following an abortion from vibriosis, ewes do not carry the infection and are immune for at least a year. Since ewes in the late stages of pregnancy are readily infected by contamination of feed and water, it is important to isolate those that abort and to remove all infected material. In 1951, about 50,000 ewes aborted in Colorado from vibriosis and about 5 per cent of the aborting ewes died.—*Rocky Mt. Vet., Nov., 1956.*

## Temperatures and Fertility of Rams

That summer temperatures are partly responsible for poor conception rates of ewes bred early in the breeding season is indicated by experiments at the University of Kentucky. The volume of semen produced by rams kept under uncontrolled conditions, and those kept in an air-conditioned room at 45 to 48 F., was not significantly different, but semen samples taken from August 20 to September 24 showed a motility rate of 70.3 per cent for the sheltered rams and 41.8 per cent for the controls; also, a significantly higher sperm cell concentration. The average rectal temperatures and pulse rates of sheltered rams were significantly lower.

Of 50 ova recovered from 30 ewes bred early in the season by control rams, then slaughtered, 20 per cent showed cleavage compared with 64.2 per cent of 53 ova recovered from ewes bred by the sheltered rams. For the ewes bred at the same time, and not slaughtered, the lambing percentage was 50 per cent for the sheltered rams, 13.3 per cent for the control rams. The estimated embryonic death loss also was higher in ewes bred to control rams. These results indicate that the conception rate of ewes bred early in the season could be improved by keeping the rams at lower environmental temperatures during the summer months.—*J. Anim. Sci., Feb., 1957.*

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*Effect of Insulating a Ram's Scrotum.*—The temperature increase caused by insulating the ram's scrotum caused a decrease in the number of spermatozoa and an increase in the proportion which were dead and abnormal. This effect was transient.—*Proc. Third Internat. Cong. Anim. Reproduction, Cambridge, 1956 (Sec. 1, 108-109); abstr. in Vet. Bull., Jan., 1957.*

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*Transfer and Storage of Sheep Ova.*—The transfer of 115 fertilized ova from one ewe to another is reported. A few survived when estrus in the 2 ewes commenced 96 hours apart, but 80 per cent of 33 survived when the onset of estrus in the ewes was within a 24-hour limit. Some transfers were successful when the ova were stored at 5 to 8 C. for 24 to 72 hours.—*Proc. Third Internat. Cong. Anim. Reproduction, Cambridge, 1956 (Sec. 3, 7-9); abstr. in Vet. Bull., Jan., 1957.*

# Clinical Data

## Effect of Constant Intake of Chlortetracycline on Pneumonia, Enterotoxemia, and Production in Nursing Lambs

BLAINE McGOWAN, D.V.M.

*Davis, California*

THE NORTH-COAST section of California is predominantly mountainous range country, particularly well adapted to sheep raising. The area annually produces 300,000 to 400,000 feeder lambs of variable quality, which are transported to the interior valleys of the state and fattened on irrigated pasture. Sheep raising has become increasingly hazardous in the area because of (1) a significant mortality from enterotoxemia in the nursing lamb, (2) a high percentage of poor-quality feeder lambs as compared with fat lambs at weaning, and (3) a high mortality from a "shipping fever" pneumonia following transport to the interior irrigated pasture districts.

Adding chlortetracycline* to the ration of lot-fed lambs has been reported by several workers.[1-6] A search of the literature, however, revealed a scarcity of information regarding the effect of this drug on production and disease control when added to the ration of nursing lambs under range conditions.

This paper describes a field trial in which chlortetracycline was included in the ration of nursing lambs daily, from birth to weaning, in an attempt to control pneumonia and enterotoxemia. Because any therapeutic or prophylactic measure incorporated into husbandry and management practices must in itself be economically feasible, data on weight gains, carcass grades, and yields have been collected and are also presented.

### MATERIALS AND METHODS

In the trial, conducted on a large sheep ranch in the north-coast section of California, 650 ewes were segregated from the ranch stock until they lambed. Immediately after each lambing, the ewe and her lambs were branded for identification and placed in one of three groups, taken in rotation, until each group consisted of 200 lambs plus their mothers. Each trial group was placed on a fenced native pasture proved in past years to be adequate to carry a like number of ewes and lambs through the winter and spring. The groups were rotated on the designated pastures at approximately two-week intervals to minimize possible inequality in pastures.

From birth, the lambs in group A had free access to creep feeders containing a basal ration of 35 parts of barley, 57 of alfalfa, and 8 of molasses with chlortetracycline added at the rate of 50 mg. per pound of feed for the first 55 days, 25 mg. for days 56 to 86, 10 mg. for days 87 to 147, and 25 mg. for days 148 to 163. These levels were fed in an attempt to maintain a daily intake of 0.5 mg. of the drug to 1.0 lb. of body weight. The ration was fed in the form of crumbles to the baby lambs, and as 3/8-inch pellets as the lambs grew larger.

The lambs in group B received the same supplement but without addition of chlortetracycline. The lambs in group C were given no supplemental feed.

The groups were maintained on this regimen from December until June, when lambs in this area are usually weaned and sold since the native pasture will no longer support both ewes and lambs.

An electric freezer was installed at the trial site to preserve lambs that died. They were transported to the laboratory once each week for a complete postmortem examination.

A positive diagnosis of enterotoxemia was based upon the appearance of petechial or ecchymotic hemorrhages on the intestinal serosa, abdominal or diaphragmatic peritoneum, thymus, epicardium, or endocardium. Also considered before making a definite diagnosis were the presence of excess fluid, with or without a fibrin clot, in the pericardial sac or a history of sudden death in a thrifty lamb with absence of any other significant pathological change.

At 6 weeks of age and again at weaning, 5 apparently normal lambs from each group were killed for necropsy.

On days 107 and 142 of the trial period, the lambs were each drenched with 2 oz. of a suspension containing 12.5 Gm. of phenothiazine per ounce. No other medication or therapy was given.

At weaning, all lambs were trucked from the trial site to an irrigated clover ranch some 170 mi. distant. Upon arrival, the three groups were thoroughly mixed in a holding corral and then sorted, by an independent lamb buyer, as fat lambs or feeders. This was repeated the following

From the School of Veterinary Medicine, University of California, Davis.

This study was supported, in part, by a grant-in-aid from American Cyanamid Company, Pearl River, N. Y.

Presented before the combined sessions on General Practice and Surgery and Obstetrics, Ninety-Third Annual Meeting, American Veterinary Medical Association, San Antonio, Texas, Oct. 15-18, 1956.

The author thanks W. P. Rickard, rancher, and Loren Fairlee, ranch superintendent, for their cooperation during this trial.

*Aureomycin, trademark of the American Cyanamid Company, Pearl River, N. Y.

day by a second lamb buyer representing another meat packer.

Those lambs selected as fat were slaughtered immediately and their carcass grade and yield data were recorded. The lungs of all lambs slaughtered were examined for evidence of pneumonia.

## RESULTS AND DISCUSSION

Due to error in forecasting the daily intake of supplement, the treated lambs were receiving the predetermined experimental level of chloretracycline for only 48 of the 163 days of the trials. For example, from day 87 when the lambs averaged 41 lb. to day 147 when they averaged 68 lb., the average daily consumption of the drug was only 9.4 mg., which was below the 0.5 mg. per 10 lb. of body weight sought. When this was recognized, 25 mg. of the drug was again added to each pound of supplement for the last 17 days of the trial. During this last period, the treated lambs, which weighed approximately 80 lb., consumed daily an average of 27.75 mg. of chlortetracycline and gained an average of 0.78 lb. per day as compared with a gain of 0.45 lb. in the other two groups.

*Mortality.*—Pneumonia.—There were no death losses from pneumonia in any group during the course of the trial. The 5 lambs taken from each experimental group at 6 weeks of age were essentially normal at necropsy. However, 3 of the 5 lambs taken from each group at weaning exhibited red, consolidated areas, 1 to 3 cm. in diameter, in the anterior ventral portions of the lungs. Histologically, these lesions showed scattered groups of alveoli packed with polymorphonuclear cells, many of which had undergone necrosis. There were intervening areas of diffuse hyperemia, septal edema, and septal cell proliferation.

In the fat lambs that went directly to slaughter, similar lesions were found in 63.4 per cent of group A, 63.6 per cent of group B, and 64.1 per cent of group C. The significance of these lesions is not understood but they may represent a primary pathological process that predisposes lambs to a subsequent clinical break of "shipping fever" pneumonia. A detailed study of this process has been initiated and will be reported later. However, in this trial, the chlortetracycline in the ration had no influence on the incidence of this small pneumonic lesion.

Enterotoxemia.—This disease, which caused 64.3 per cent of all death losses, was distributed among the groups as shown (table 1).

The heavy loss (10%) in control group C is typical in young nursing lambs during warm, rainy weather when luxuriant pasture stimulates heavy lactation in the ewes.

The intermediate position of group B, regarding death loss from enterotoxemia, is difficult to explain unless one considers the possibility that the daily intake of a supplemental ration relatively high in fiber reduces the opportunity for a suckling lamb to gorge on milk alone or on milk and rich pasture, which are generally considered important predisposing causes of the disease. If this assumption is valid, then the difference between groups A and B would indicate that chlortetracycline is a true depressant upon *Clostridium perfringens* type D in the gut of the lamb since this was the only variant in the diets of the two groups. Whether this influence is bactericidal or bacteriostatic can not be determined from these data but the end result, a reduction in death loss from enterotoxemia, is highly desirable and agrees with the results of Johnson *et al.*[3] Variable results usually follow inoculation with *Cl. perfringens* type D bacterin and toxoids, and death losses are ordinarily sustained prior to intervention by vaccination with antitoxin. The data presented suggest, therefore, that continuous low level feeding of chlortetracycline appears to be a method by which losses from enterotoxemia may be controlled.

TABLE 1—Enterotoxemia Death Loss by Groups

| Group | No. of lambs | No. of deaths | Percent |
|---|---|---|---|
| A | 200 | 3 | 1.5 |
| B | 200 | 8 | 4.0 |
| C | 200 | 20* | 10.0 |

*Significant at the 0.01 probability level from A, and at the 0.05 level from B.

*Miscellaneous Causes.*—In each group, 3 lambs under 2 weeks of age died during a three-day storm. It was assumed that exposure was the cause of death. One lamb in group A and 1 in group C were so mutilated by crows that necropsy was impossible. Two deaths in group C were accidental. One lamb in group B died from a castration infection and 1 lamb in group A

TABLE 2—Production Data by Groups

| Group | Av. daily gain (lb.) | Fat lambs at weaning (%) | Carcass grades | | | Carcass yield (%) |
|---|---|---|---|---|---|---|
| | | | Choice (%) | Good (%) | Utility (%) | |
| A | 0.57 | 46.5 | 80.56 | 18.44 | 1.00 | 50.0 |
| B | 0.47 | 44.0 | 64.77 | 34.09 | 1.14 | 50.0 |
| C | 0.42 | 26.5 | 32.07 | 62.26 | 5.67 | 48.0 |

became so debilitated from parasitism that it was killed.

*Production and Economic Findings.*—The lambs were weighed by groups; therefore, the average daily gain could not be subjected to statistical analysis. However, the daily gains were in agreement with data that could be analyzed (table 2).

The percentage of fat lambs in groups A and B was significantly ($P<0.05$) higher than in group C. This indicates that creep feeding of lambs is a worthwhile practice under these conditions.

The number of carcasses graded choice in group A was highly significant ($P<0.01$) over group C and significant ($P<0.05$) when compared to group B. This difference is somewhat greater than reported elsewhere.[1,3]

## SUMMARY AND CONCLUSIONS

The inclusion of chlortetracycline in the grain ration of nursing range lambs exerted no influence on the incidence of a small pneumonic lesion which occurred in a high percentage of all the experimental lambs.

Mortality from enterotoxemia was significantly higher in the control group (C) than in either groups A or B. There was no significant difference in mortality between groups A and B.

Average daily gain was in favor of the treated group but was not measured statistically.

The percentage of fat lambs at weaning was slightly in favor of group A over group B but not significantly so. However, both groups A and B had a significantly higher percentage of fat lambs than group C.

The treated group (A) was significantly higher in percentage of choice carcass grades than groups B or C, and group B was significantly higher than group C.

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*Johne's Disease of Sheep.*—Johne's disease commonly affects 5 to 15 per cent of adult sheep in Scotland, causing emaciation. Four different pathological forms are described; three of them did not cause typical thickening of the bowel, making diagnosis difficult. The complement-fixation and allergic tests were of little value in sheep.—*Vet. Bull., Jan., 1957.*

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*Adsorbed Tissue Sheep Pox Vaccine.*—Sheep pox, a serious disease in Iran, has been controlled since 1930 by use of a living vaccine and partly, for the last seven years, with an aluminum gel adsorbate vaccine. Disadvantages of the living vaccine are danger of transmitting the disease, serious reactions in certain flocks, abortions, and the short period of valence of the vaccine under field conditions. More than 24 million doses of the adsorbate vaccine have given effective protection without any ill aftereffects.—*Brit. Vet. J., Dec., 1956.*

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*Protective Fraction in Anti-Hog Cholera Serum.*—In swine-protection tests against hog cholera, the protection afforded by the serum fraction containing unmodified *gamma* globulin was equivalent to that of whole serum.—*Cornell Vet., Jan., 1957.*

# What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and accompanying radiographs depicting a diagnostic problem are usually published in each issue of the JOURNAL.

***Make your diagnosis from the picture below—then turn the page ▶***

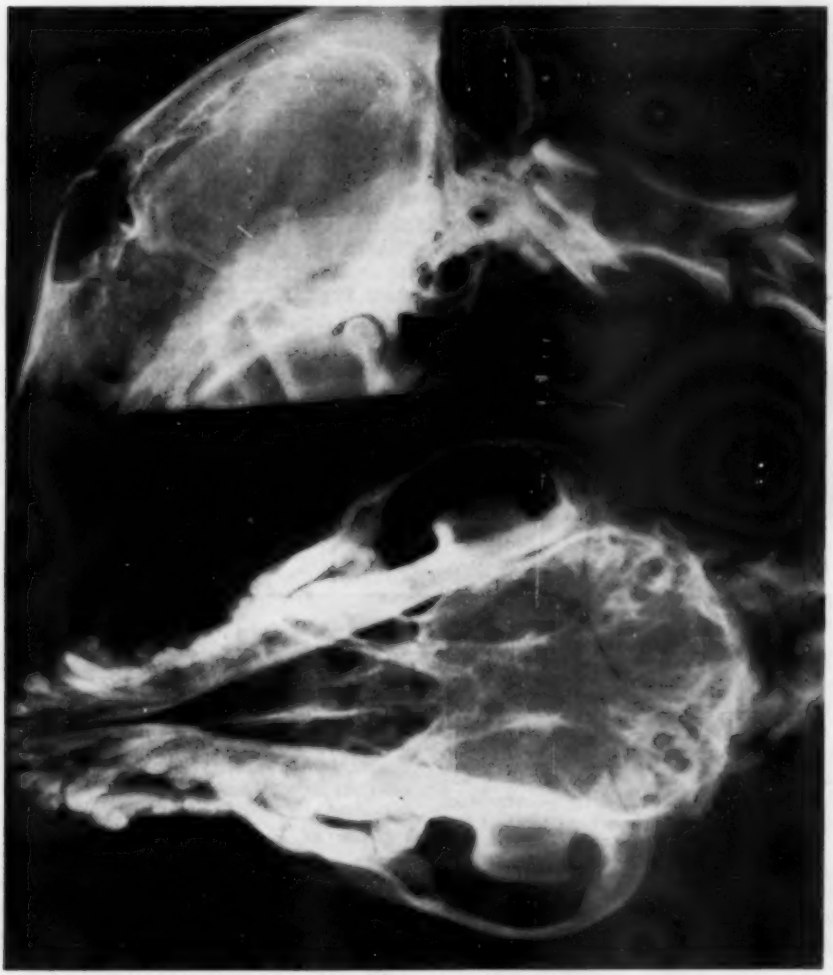

Figure 1

*History.*—A male dog of mixed breed, 5 years old, was found in the street unconscious. He was immediately brought to the hospital and radiographs, one lateral and one dorsoventral, were taken on the same film (fig. 1).

***(Diagnosis and findings are reported on next page)***

## Here Is the Diagnosis

(*Continued from preceding page*)

*Diagnosis.*—Linear fracture of the cranial floor and a depressed fracture of the frontal bone.

Fig. 2—Radiograph of a dog's skull. A—fracture of frontal sinus; B—linear fracture of the cranial cup.

This case report was submitted by Dr. Paul V. Belkin, St. Louis, Mo.

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## Why Deer's Antlers Grow Rapidly

An attempt to determine the reason for the tremendous rate of true bone deposition in the antlers of deer has been undertaken by personnel at the College of Veterinary Medicine (Dr. Robert Davis) and at the School of Medicine in Colorado. A $44,500 grant for this five-year project has been made by the National Institutes of Health. If the factor which stimulates this growth can be isolated, it might be used to increase the rate of fracture healing.—*Sci. News Letter, Feb. 2, 1957.*

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*Meprobamate Is Toxic to Man.*—Many side effects and undesirable actions of meprobamate (miltown, equanil) are being discovered and recorded. They include severe and widespread skin reactions, such as purpuric rashes and severe itching; excitement, excessive peristalsis, and diarrhea, instead of sedation; also purpura and edema. These results strongly suggest that the drug can release histamines. In a controlled trial with 51 patients, the effects were similar to those of sodium amylobarbitone (a much cheaper drug), except that urticarial rashes followed the use of meprobamate in five patients.—*Brit. Med. J., Nov. 24, 1956.*

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*Low Temperature for Shock Victims.*—Low temperatures increased survival time for animals in a state of shock. For rats, 68 F. was optimal with lower or higher temperatures being increasingly harmful. —*Sci. News Letter, Feb. 16, 1957.*

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More than three of four U. S. farmers own all or part of the land they work. This ownership has increased since 1930, from 57 to 76 per cent.—*Prairie Farm., March 2, 1957.*

# The Kidney in Health and Disease

W. J. ZONTINE, D.V.M.

*Lancaster, California*

IT HAS BEEN estimated that 55 per cent of dogs of all ages and 80 per cent of dogs over 8 years of age show evidence of chronic interstitial nephritis.[1] Certainly a condition as common as this justifies a better understanding by practitioners. A better knowledge of renal physiology would enable us to recognize pathological changes in the kidney earlier and permit more intelligent therapy.

## THE NORMAL KIDNEY

*Anatomy.*—In order to appreciate abnormal tissue changes in the kidney, we must have knowledge of the normal structure and physiological actions of the organ. The basic renal unit is the nephron, consisting of a glomerular capsule, the renal tubule composed of the proximal convoluted tubule, Henle's loop, and the distal convoluted tubule which terminates as the collecting tubule, emptying into the renal pelvis (fig. 1). The various parts of the tubule have different cellular structures which, no doubt, accounts for the different functions exhibited by the different levels of the unit. By actual count, the canine kidney has 300,000 to 726,000 nephron units.[2]

Peculiarities, not found anywhere else in the body, exist in the kidneys' blood supply. Blood is derived directly from the aorta via the short renal artery which insures the high blood pressure necessary for adequate kidney function. The renal artery subdivides and terminates as a capillary tuft—the renal corpuscle. The capillary arrangement is unique in several respects[3]:

1) There are no anastomoses.

2) The efferent vessel is smaller than the afferent arteriole which, along with arteriolar constriction, aids in the maintenance of a high glomerular pressure, a capillary pressure unequaled anywhere else in the body. On leaving the glomerulus, the arteriole divides, forming the medullary plexus which, after supplying the tubules, reunites to form the renal vein.

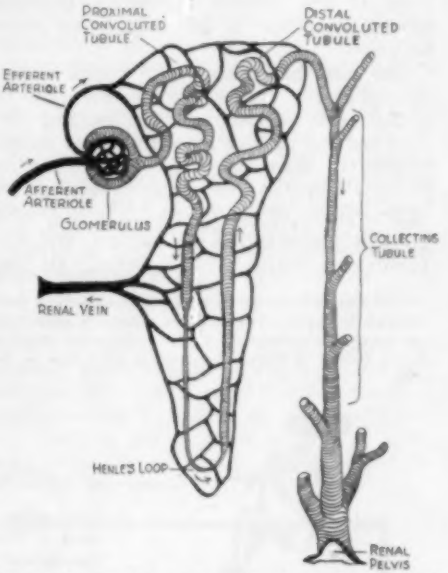


**Fig. 1—The nephron unit of the dog with its blood supply. The collecting tubule is theoretically not part of the nephron unit.**

3) Practically all the blood supplying the entire kidney must first pass through the glomerular capillaries.

The nerve supply to the kidneys consists of vasoconstrictor and vasodilator fibers only—no secretory fibers. This bears out the theory that urine formation is controlled by dilation and constriction of the blood vessels rather than by specific secretory action.

*Physiology.*—The modern theory of urine formation is one of filtration, secretion, and selective reabsorption. The filtrate which passes the glomerular membrane is a colorless liquid, having a specific gravity near 1.010.[3] In the past, this filtrate was presumed to be protein-free. However, recent research has revealed that the filtrate actually contains minute traces of protein which are absorbed by the tub-

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The author thanks Drs. C. E. Bild, Mark L. Morris, and C. E. Cornelius for their assistance and helpful criticism in the preparation of this paper, and Mrs. Lucille Von Wolffersdorff for her help in drawing the figures used.

ular cells, resulting in a urine free of protein.* As the filtrate progresses down the tubule, certain substances (high threshold substances) are reabsorbed by the tubular cells and those of no use to the body (low threshold substances) are rejected. In addition, substances, such as ammonia, are added to the filtrate. Usually, only 1 per cent of the filtrate ultimately becomes urine, the other 99 per cent being reabsorbed.[4]

The proximal convoluted tubule is responsible for the active reabsorption of sodium (80 to 85%), potassium, and glucose and the passive reabsorption of water. Water is also passively reabsorbed in Henle's loop. In the distal tubule, active reabsorption of water occurs along with passive reabsorption of sodium and the tubular excretion of potassium. Of the potassium absorbed in the proximal tubule, 90 per cent is excreted in the distal tubule, 10 per cent being retained. The active water reabsorption at this level of the tubule is controlled by an antidiuretic-diuretic mechanism of the pituitary gland, the antidiuretic portion secreted by the posterior lobe and the diuretic principle from the anterior lobe. The active reabsorption of sodium in the proximal tubule and, possibly, the excretion of potassium in the distal tubule are also under hormonal control, *i.e.*, from the adrenal cortex (fig. 2).

*Functions of the Kidney.*—In attempting to analyze the pathological changes occurring with renal damage, we must bear in mind the main functions of the kidney: (1) to rid the body of waste products of metabolism; (2) to rid the body of foreign and nonendogenous substances; (3) to help maintain water balance; (4) to help maintain pH of the body fluids; and (5) to reabsorb and save important metabolites, e.g., amino acids.

*This fact probably accounts for the proteinuria of acute interstitial nephritis in which the glomerulus is normal but tubular damage prevents the protein reabsorption, resulting in the finding of detectable quantities of protein in the urine.

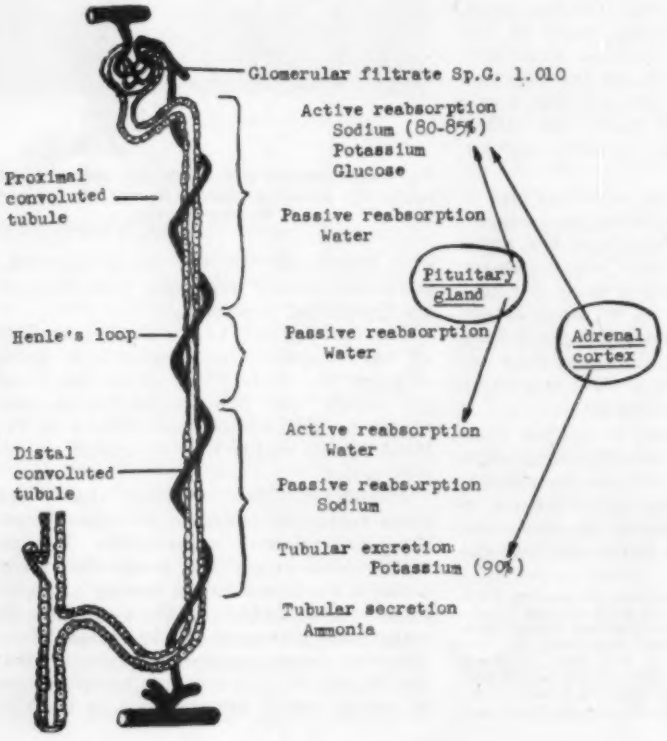
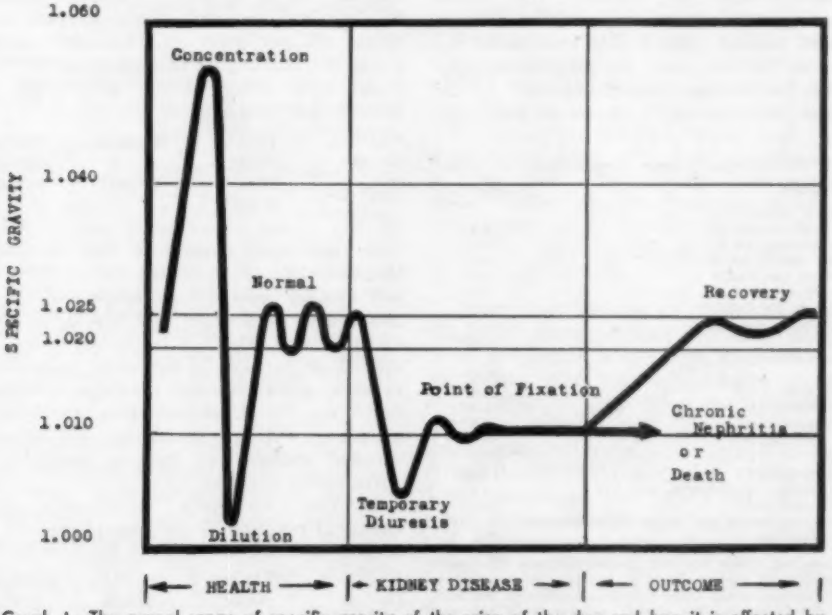



Fig. 2—Schematic drawing of a canine nephron unit indicating the main functions of the various parts.

## THE DISEASED KIDNEY

*Anatomy.*—Usually, the kidney damaged by chronic interstitial nephritis is fibrotic, scarred, and shrunken and the normal interstitial tissue changes to scar tissue. Gradually, the blood supply to the tubular cells is reduced. Since only 25 per cent of kidney tissue is needed for maintenance of the body, early changes often go unnoticed until over 75 per cent of the tissue is destroyed. Polyuria, polydipsia, vomition and anorexia then appear.

*Physiology.*—When damage occurs to the kidney, all of its functions are altered to a greater or lesser degree, some sooner than others. The ability of the kidney to maintain body water balance is the first activity to show significant impairment in nephritis.[4] The normal canine kidney can concentrate urine to a specific gravity of nearly 1.060 and can dilute it, under extreme conditions, to as low as 1.001. When renal disease begins, a transient diuresis occurs as a compensatory measure on the part of the organ. This stage is described in man but its occurrence in the canine kidney is disputed.[5] Following this stage the urine specific gravity becomes fixed at 1.008 to 1.012 with an average of 1.010, which is identical with the specific gravity of the glomerular filtrate as it begins its progress down the tubule. Since water is absorbed in the tubule, the degree of tubular damage can thus be estimated. As renal disease progresses, the specific gravity usually remains about 1.010. Therefore, this measurement of kidney function is of greatest value in following the course of kidney disease, but only from a mild to a moderately severe form, *i.e.*, until the specific gravity reaches the fixed point. Depriving the animal of water overnight (12 to 18 hr.) and measuring the specific gravity of the first urine passed in the morning, gives a good indication of the degree of kidney damage. A specific gravity of 1.025, or higher, shows that no significant damage has occurred but does not rule out the presence of early nephritis. Specific gravities of less than 1.025 can indicate significant tubular damage. Once the specific gravity reaches 1.010, no further change will occur until kidney function again begins to return to normal (graph 1). At this point, other laboratory aids, e.g., blood urea determinations, must be




Graph 1—The normal range of specific gravity of the urine of the dog and how it is affected by renal damage.

utilized to correctly evaluate the status of the patient.

Measurement of the amount of waste products of metabolism remaining in the blood stream is a second valuable method of analyzing kidney damage. Waste products excreted are both inorganic (chlorides, phosphorus, sulfur, etc.) and organic (urea, uric acid, creatinine, etc.) (table 1). Urea, which comprises the greatest percentage of the over-all organic waste products, is easily measured in canine blood.[6] This criteria is subject to error, however, because normally 40 per cent of the urea cleared through the glomerulus is resorbed. Also, the production of urea may be altered by factors such as increased protein ingestion, dehydration, or starvation, which result in excessive destruction of body proteins,[7] thus giving a misleading picture of the amount of kidney involvement. This should be considered when interpreting the laboratory report. However, an elevated blood urea usually indicates renal impairment and should not be evaluated too critically.

Maintenance of the pH of the body fluids, an important factor, is perhaps the function least understood and most often ignored in therapy. Actually, the kidney serves as a third and final line of defense in this respect; the buffer system of the blood is the first, and the respiratory system is the second, line of defense.[8] In the normal diet of a carnivore or an omnivore, the large amount of protein ingested results in the formation of an excess of potential acid ions, principally as sulfates ($SO_4--$) and phosphates ($PO_4--$), which are excreted in the urine. The alkaline buffer system of the blood, as bicarbonate, combines with these acid waste products and excretes them as a slightly alkaline glomerular filtrate. Obviously, if these alkaline compounds were excreted in the urine unchanged, it would soon deplete the bicarbonate (alkaline) reserve of the body, resulting in acidosis (alkaline deficit). The kidney prevents this loss and keeps the acid-base ratio in equilibrium by means of two mechanisms: the bicarbonate and ammonia mechanisms.

TABLE I—Average Normal Composition of Urine*

| Constituents | Grams/liter |
|---|---|
| Inorganic constituents | |
| Chloride (as Na Cl) | 9.0 |
| Phosphorous (as $P_2O_5$) | 2.0 |
| Total sulfur (as $SO_3$) | 1.5 |
| Sodium (as $Na_2O$) | 4.0 |
| Potassium (as $K_2O$ | 2.0 |
| Calcium (as CaO) | 0.2 |
| Magnesium (as MgO) | 0.2 |
| Iron | 0.003 |
| Organic constituents | |
| Urea | 25.0 |
| Uric acid | 0.6 |
| Creatinine | 1.5 |
| Ammonia | 0.6 |
| Undetermine N | 0.6 |
| Sugar | Trace |
| Ketone bodies | Trace |
| Carbonates, bicarbonates, and free carbonic acid | Trace |
| Pigments, mucin and mucin-like substances, and diastase | —— |

*This chart (after Best and Taylor) indicates the normal composition of human urine. In general, the composition of canine urine is the same with the exception of uric acid. Only the Dalmatian dog shows any amount of uric acid in the urine. In other dogs, this substance is replaced by allantoin.

1) The Bicarbonate Mechanism.—It should be remembered that the buffer system of the blood consists of the salts of bicarbonate (65%), hemoglobin (30%), and phosphate and plasma proteins (5%) which are in equilibrium with each other.[4] Therefore, when referring to bicarbonate, the status of this salt reflects the state of the other buffers. The terms "alkalosis" and "acidosis" are only relative as the blood is actually slightly alkaline in reaction with a pH of 7.4; it would be more appropriate to speak of "alkaline excess" or "alkaline deficit." Since sodium comprises 90 per cent of the total cations (+), the amount of this element not combined with other anions determines the bicarbonate concentration, thus:

$$\underset{\text{(in filtrate)}}{Na_2HPO_4} + \underset{\text{(from tubule cells)}}{H_2CO_3} \rightarrow \underset{\text{(reabsorbed)}}{NaHCO_3} + \underset{\text{(excreted in urine)}}{NaH_2PO_4}$$

pH 7.4 pH 4.5

The significant feature of this process is the exchange of hydrogen (H+) for sodium (Na+) ions. This results in the reabsorption of sodium and the bicarbonate ($HCO_3$), with which it combines ($NaHCO_3$), and their return to the body as alkaline reserve. Renal damage prevents this enzymatic reaction from occurring, resulting in an alkaline deficit (acidosis) due to a decreased amount of sodium available to form buffer systems.

2) The Ammonia Mechanism.—This chemical reaction is the second method the kidney utilizes to conserve fixed base:

$$\underset{\text{(in filtrate)}}{Na_2SO_4} + \underset{\text{(from tubule cells)}}{2NH_4HCO_3} \rightarrow \underset{\text{(reabsorbed)}}{2NaHCO_3} + \underset{\text{(excreted in urine}}{(NH_4)_2SO_4}$$

In this process, ammonia ($NH_4+$) ions from the tubular cells are exchanged for sodium ($Na+$) ions in the filtrate, again resulting in the reabsorption and saving of sodium and fixed base as in the bicarbonate mechanism. Ammonia used in this reaction is a readily available and a biologically cheap end product of protein metabolism derived from the breakdown of amino acids.[9]

## CONCLUSION

In order to better understand and treat renal impairment, the normal kidney anatomy and physiology must be understood. Early kidney damage can be detected (1) by the specific gravity of the urine and (2) by measurement of the urea content of the blood. The alteration of the normal acid-base balance of the body produced by kidney damage is one of the most important and least understood changes which occur; it deserves further study by the practitioner concerned with nephritic patients.

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## Disc Protrusion in the Dog

An important feature of the canine intervertebral disc is the mucoid nucleus pulposus which is surrounded by a fibrous ring, the annulus fibrosus. The nucleus pulposus, normally under pressure in the living dog, escapes with considerable force when the annulus fibrosus is ruptured. Why the annulus fibrosus is subject to rupture in some animals, especially dogs of certain breeds, is unknown.

It appears that several main anatomical factors control canine intervertebral disc protrusion (herniation of the nucleus pulposus). The extraordinary senescence of the intervertebral disc while the dog is yet in the prime of life is undoubtedly the basic factor. During middle age, the nucleus pulposus loses its resilience and, simultaneously, the annulus fibrosus loses its elasticity and toughness due to degeneration of the fibrous lamellae. These changes begin in the normal dog at 1 year of age and are often quite advanced by the second year. The incidence of disc herniation is greatest between 3 and 8 years of age. Thus, the added concussion, due to the loss of the normal shock-absorbing function, causes the nucleus pulposus to rupture through the annulus, particularly during some violent or unexpected strain.

These adverse changes in the intervertebral disc are abnormally accelerated in the "chondrodystrophoid" breeds such as the Dachshund, Pekingese, and Cocker Spaniel. While it can occur at any point, a dorsal herniation of the nucleus pulposus is the most common in the dog. This is probably because the strain is the greatest and the annulus fibrosis is thinnest dorsally.

At necropsy of 104 dogs with a total of 136 protrusions, it was found that 95 (70%) were in the lumbar region, 24 in the thoracic, and 17 in the cervical region.

It was estimated that 80 per cent of the dogs would have recovered spontaneously in nine weeks; the majority show improvement within one month.—[*A. S. King: The Anatomy of Disc Protrusion in the Dog. Vet. Rec., 68, (Dec. 8, 1956): 939-944.*]—J. E. WEST.

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*Dogs Not Descended from Jackals.*—While all canine species doubtless descend from a common source, the jackal and its equivalent, the coyote, probably evolved in a different line from the dog. While wolf-dog crosses are common, coyote-dog crosses are rare. Also, in cell division, it has been established that the dog has 78 chromosomes, the jackal only 74; and, while chromosomes may be reduced in a line of descent, the number is rarely increased. Furthermore, the colony life of the dog is much more like that of the wolf than of the coyote or jackal.—*E. N. Wentworth in Pure-Bred Dog, Jan., 1957.*

# Bluecomb Disease of Turkeys. IV. Demonstration of a Filterable Agent

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BLUECOMB DISEASE of turkeys may be described as a catarrhal enteritis which affects turkeys of all ages. A description of the symptoms and gross lesions observed in turkeys from field outbreaks and experimentally infected poults has been published.[1] Bluecomb disease in turkeys is believed to be similar or identical to several syndromes. Among these are x disease,[2] pullet disease,[3] bluecomb disease,[4] contagious indigestion,[5] avian monocytosis,[6] and avian infectious diarrhea.[7]

Several investigators have attempted to establish the etiology of bluecomb disease in chickens and turkeys. Because of conflicting opinions concerning the etiology of this disease, filtration experiments were initiated as one means of studying the physical characteristics of the infectious agent. Data will be presented to show the filterability of the bluecomb agent through several different filter elements of graded pore size.

In 1941, it was suggested[8] that pullet disease of chickens was caused by certain strains of *Escherichia coli*. However, no bona fide evidence was found to support this contention[9] and bluecomb disease in chickens was not produced by injecting or feeding cultures of *Esch. coli*.[10]

The first evidence that bluecomb disease of chickens was caused by a virus was supplied[5,11] when a filterable agent was recovered from the blood of hens acutely infected with the disease. In addition, it was shown that bacteria-free filtrates of feces from infected birds would transmit the disease to chickens and chicken embryos. The virus grew readily on the chorioallantoic membrane of chicken embryos and tissues from these embryos, when injected into chickens, produced depression and cyanosis of the head but not death. Since infected chicken embryo tissues failed to produce death when injected into chickens, it was not possible to demonstrate that the filterable agent was the sole cause of this disease.

Numerous attempts to isolate a virus-like agent from chickens infected with pullet disease were unsuccessful.[6]

In 1952, a disease of chickens called "avian diarrhea" was reported.[7] Clinically, it resembled bluecomb disease in chickens. Bacteria-free filtrates prepared from the intestinal contents of these birds were highly infectious for susceptible chickens and chicken embryos, which died from 36 to 72 hours following inoculation. Fourteen serial passages were accomplished in chicken embryos before the virus was lost.

A disturbance in turkeys similar to bluecomb disease in chickens was observed.[3] The disease could not be reproduced by inoculating supposedly susceptible birds with filtered and unfiltered extracts of infected tissues and intestines.

A striking similarity was noticed[12] between an unfamiliar condition of turkeys termed "mud fever" and bluecomb disease in chickens. During the spring and summer of 1950, the disease was observed for the first time in brooder house and range poults. Although laboratory transmission proved practically impossible, it was believed that the evidence strongly pointed to an infectious disease.

The first definite proof that bluecomb disease of turkeys is infectious in nature was reported in 1953.[1] It was demonstrated that the disease was serially transmissible in day-old poults. However, the disease was not established in day-old poults with bacteria-free filtrates of intestinal suspensions from infected birds.

It was later reported[13] that the causal agent of bluecomb disease in Minnesota turkeys was (1) smaller than most intestinal bacteria, (2) larger than filterable viruses, (3) susceptible to antibiotics, (4)

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labile in artificial mediums, and (5) propagable in chicken embryos.

## MATERIALS AND METHODS

*Experimental Birds.*—The day-old, Broad White poults used in these studies were obtained from a United States pullorum-typhoid clean hatchery. The breeding flocks had no previous history of bluecomb disease. The majority of the birds were housed in modified Horsfall-Bauer units, while the remainder were placed in standard brooders well removed from other birds. All birds were fed *ad libitum* on an antibiotic-free, practical-type ration containing 26 per cent protein.

*Inoculum and Inoculation.*—The infectious agent used in these studies was originally obtained from the intestines of young turkeys acutely affected with bluecomb disease. The disease was first perpetuated in the laboratory by serial transmission of intestinal material in day-old poults. However, once the strain was established, only those birds which had been inoculated with a bacteria-free filtrate and showed the typical symptoms and lesions of the disease were selected for source material. The 20 per cent intestinal suspension used in these studies was prepared by triturating the intestine and its contents in nutrient broth and clarifying the resultant suspension by filtration through gauze. A supernatant of this intestinal suspension was prepared by centrifugation at 1,400 x g for 25 minutes. The pooled supernatant material was used directly for inoculation and also as the original material for all of the filtration studies here reported. Each poult received 5 drops (0.3 ml.) of the various inoculums via the oral route.

For one series of studies, a 20 per cent suspension was prepared from the intestines of clinically normal poults in the manner indicated above. Dosage of this inoculum was the same as that for all other groups.

Deaths were recorded daily for ten days. Dead birds were examined for the typical lesions of bluecomb disease and for the possible presence of Salmonella organisms or other pathogens by the method listed below. Accidental deaths were not included in the mortality percentage figures.

*Filters and Filtration.*—Berkefeld, V, N, and W; Selas 01, 02, and 03; sintered glass, U.F.; and Seitz EK filters were used in these experiments. The filters were cleaned, sterilized, and used according to the manufacturers' recommendations in each case. The Berkefeld and Selas filters were used under a negative pressure of 5 to 15 cm. of mercury, while the Seitz and sintered glass filters were used with 5 to 10 and 20 to 40 cm. of negative pressure.

*Cultural Methods.*—The intestinal contents and liver of all dead experimental poults were cultured for the possible presence of Salmonella and other pathogenic organisms by use of accepted methods. The various filtrates used in these studies were checked for the presence of bacteria by inoculation of 1.0 ml. of the material into Brewer's thioglycollate medium and also by streaking 0.5 ml. of the filtrate on each of two blood agar plates. One plate was incubated aerobically and the other anaerobically.

## RESULTS

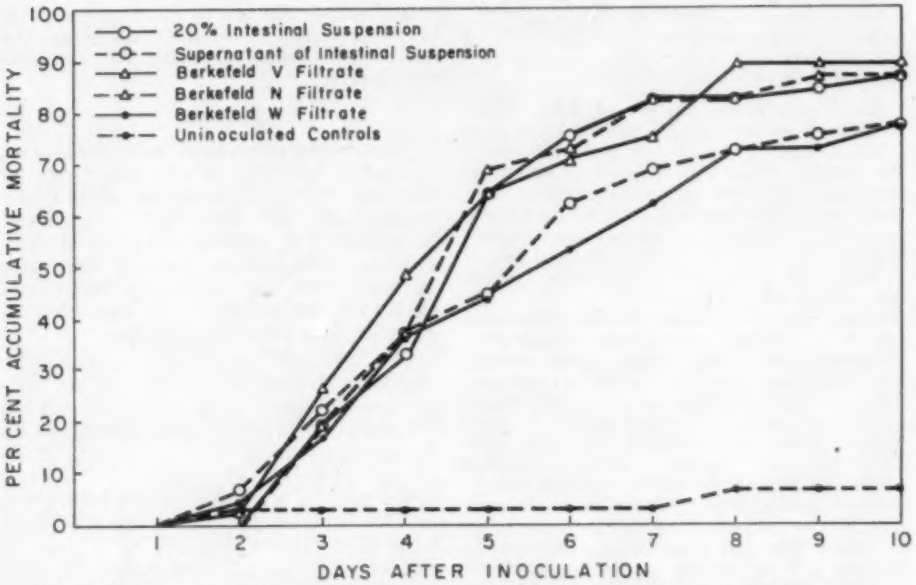
Various inoculums used in the first series of studies consisted of the following: 20 per cent infective intestinal suspension; supernatant of intestinal suspension; Berkefeld V, N, and W, and sintered glass filtrates. Uninoculated controls were also included. Of the inoculums mentioned above, the Berkefeld W, N, and sintered glass filtrates were bacteria-free.

The average percentage accumulative mortality of three replications for the various groups under study are shown (graph 1), except the sintered glass filtrate which is presented in a separate graph. Each group contained 45 poults; the control group had 33. Mortality ranged from a low of 77.8 per cent for the groups inoculated with Berkefeld W filtrates to a high of 88.9 per cent for the Berkefeld V filtrates. The Berkefeld N filtrates produced a mortality of 86.7 per cent, while the 20 per cent suspension and its supernatant produced a mortality of 86.7 per cent and 77.8 per cent, respectively. Uninoculated controls had a mortality of 6.1 per cent.

The average percentage accumulative mortality of three replications, in poults receiving sintered glass filtrates, is shown (graph 2). It should be noted that figures for the 20 per cent intestinal suspension, supernatant of the suspension, and uninoculated controls are identical to those used in graph 1 since the sintered glass filtrates were included in this series of studies. Mortality in the groups inoculated with sintered glass filtrates averaged 51.1 per cent for the three trials.

Examination of dead birds receiving the various inoculums in the first series of studies revealed typical symptoms and lesions of bluecomb disease in every bird necropsied. No Salmonella species or other pathogens were detected from bacteriological examinations of the liver and intestines. There was no evidence of bluecomb disease in any of the uninoculated control poults.

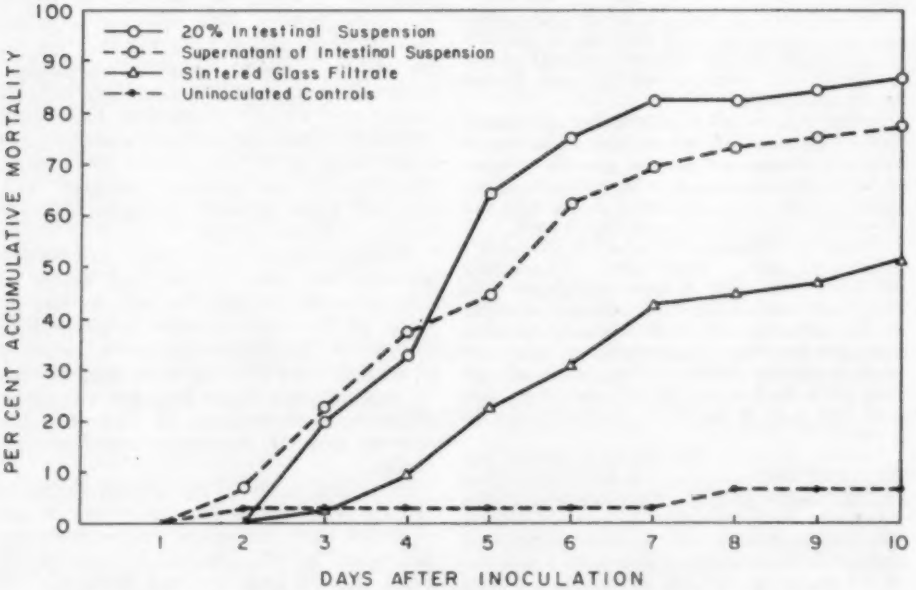
Inoculums used in the second series of studies consisted of the following: 20 per cent infective intestinal suspension; supernatant of the intestinal suspension; Selas 01, 02, and 03; and Seitz EK fil-



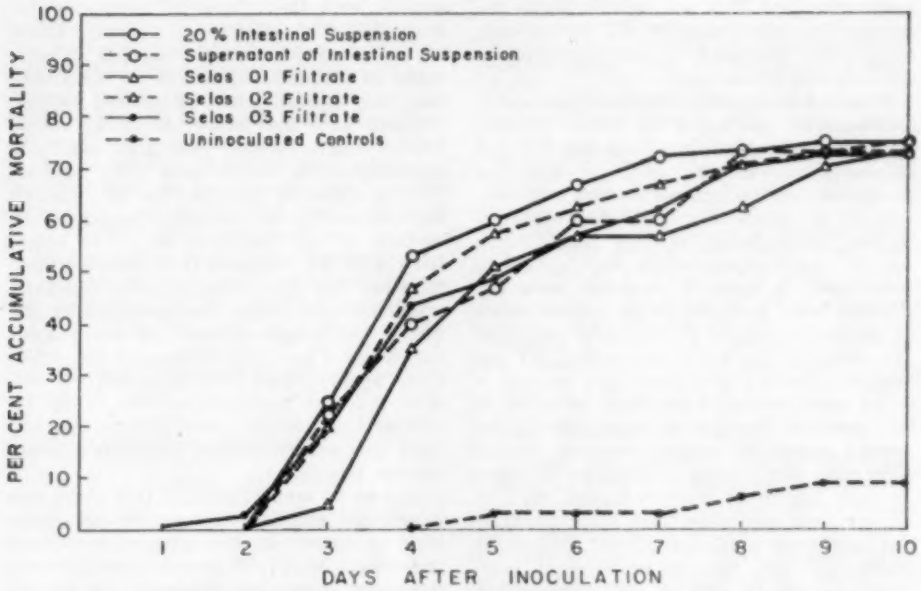

Graph 1—The accumulative mortality produced by graded Berkefeld filtrates in day-old poults.

trates. An uninoculated control group was included. Of the inoculums mentioned above, the Selas 02 and 03 and Seitz EK filtrates were bacteria-free.

The average percentage accumulative mortality of three replications for the various groups under study are shown (graph 3); the Seitz EK filtrates are presented in

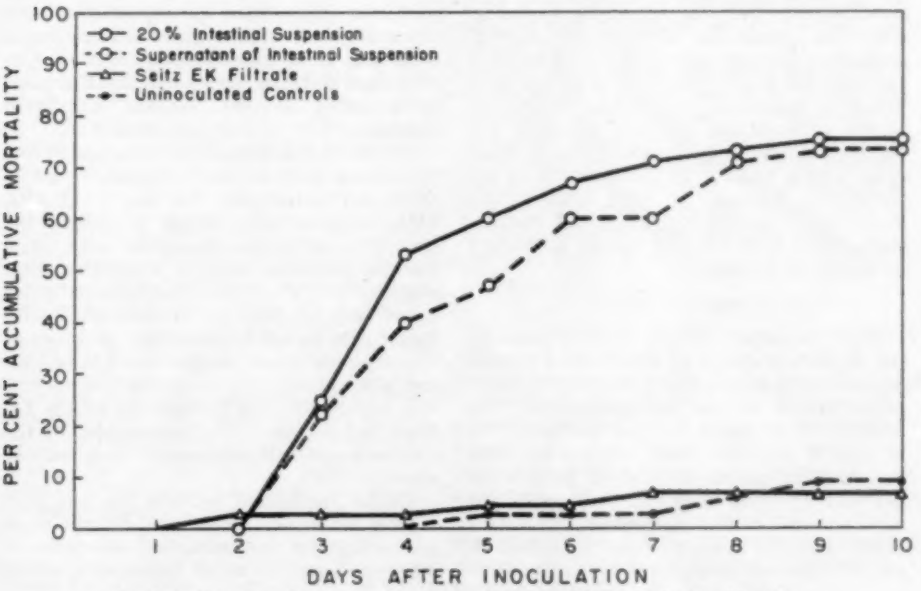



Graph 2—The accumulative mortality produced by sintered glass filtrates in day-old poults.




Graph 3—The accumulative mortality produced by graded Selas filtrates in day-old poults.

a separate graph. Each group contained a total of 45 poults, except the controls which had 31. Mortality in poults receiving the three Selas filtrates was 73.3 per cent for Selas 01, 75.6 per cent for Selas 02, and 73.3 per cent for Selas 03. These figures compare with 75.6 per cent in poults inoculated with the 20 per cent intestinal




Graph 4—The accumulative mortality produced by Seitz EK filtrates in day-old poults.

suspension and 73.3 per cent in those receiving the supernatant of the 20 per cent suspension. Mortality in the uninoculated controls was 9.7 per cent.

Graph 4 shows the average percentage accumulative mortality of three replications in poults receiving Seitz EK filtrates as compared with that obtained with the 20 per cent intestinal suspension, supernatant of the suspension, and that observed in the uninoculated controls. The figures for the three latter groups are identical to those used in graph 2 since the Seitz EK filtrates were included in the second series of studies. Mortality in the poults receiving the Seitz EK filtrate averaged only 6.7 per cent.

An examination of the dead birds which had received the various inoculums in the second series of studies revealed typical symptoms and lesions of bluecomb diseases in each specimen. Bacteriological cultures of the liver and intestines were negative for Salmonella species and other pathogenic bacteria. There was no evidence of bluecomb disease in any of the uninoculated control poults.

Since it seemed possible that the flora from older birds, when introduced into day-old poults, could produce symptoms and lesions similar to bluecomb disease, an experiment was designed to rule out this possibility. The average mortality in poults receiving a 20 per cent suspension prepared from the intestines of clinically normal poults was 8.0 per cent compared with 75.6 per cent for poults receiving a 20 per cent infective intestinal suspension. Mortality in the uninoculated controls averaged 8.0 per cent. This study involved two replications with a total of 25 poults for both experiments. Necropsy of dead birds in the group receiving normal intestinal suspensions failed to reveal any lesions indicative of bluecomb disease.

## DISCUSSION

Data presented (graph 1) for studies on the Berkefeld series of filters show a close correlation between the accumulative mortality for all of the inoculums used. The infectivity produced by the Berkefeld V, N, and W filtrates closely approached that observed in poults inoculated with a 20 per cent infective intestinal suspension and supernatant of that suspension. The data show that the bacteria-free Berkefeld N and W filtrates produced a mortality comparable with that found in remaining inoculums which contained bacteria. Since the uninoculated controls showed no evidence of bluecomb infection or other disease, this mortality was considered normal.

These data also show that the various filtered and unfiltered inoculums produced mortality rates which were very similar.

It is apparent (graph 2) that although the accumulative mortality reached an average of 51.1 per cent in poults inoculated with the bacteria-free sintered glass filtrates, the infectivity of this inoculum was somewhat below that produced by the 20 per cent suspension and its supernatant, indicating a partial retention of the infectious agent. These data also make it evident that the mortality of the group receiving the sintered glass filtrate was less than that of the groups receiving the unfiltered inoculums.

It may be seen (graph 3) that there was practically no difference in the accumulative mortality of the groups inoculated with the Selas 01, 02, and 03 filtrates when compared with that observed for the 20 per cent intestinal suspension and the supernatant of the suspension. These data show that the bacteria-free filtrates obtained from Selas 02 and 03 filters produced an accumulative mortality as great as that of the other inoculums which were not bacteria-free. Mortality for the control group was considered normal since no evidence of bluecomb or other disease could be found. It is also apparent that no significant difference exists among the mortality rates of the various inoculated groups.

The Seitz EK filtrate, as obtained by the techniques used in these studies, failed to show any infectivity for day-old poults. This is illustrated (graph 4) where the mortality in poults inoculated with Seitz filtrates averaged slightly lower than that observed in the uninoculated controls. Since a necropsy of dead poults inoculated with the filtrate failed to reveal the presence of bluecomb or other disease conditions, the mortality observed was considered normal. The highly adsorbent properties of the EK filter pad is felt to be responsible for the apparent complete removal of the infectious agent.

Poults inoculated with a 20 per cent normal intestinal suspension did not show any symptoms or lesions of bluecomb or other diseases. Since all bacteriological ex-

aminations were negative for pathogens, the mortality was considered normal. This clearly shows that the normal flora of older birds is not the cause of symptoms and lesions observed in poults used in these studies.

The possibility that the presence of a bacterial toxin in the bacteria-free filtrates could cause symptoms and lesions typical of bluecomb disease was considered but was ruled out by the fact that the disease was serially transmitted numerous times, using only bacteria-free filtrates as inoculum.

The results obtained in these experiments are not in agreement with those of Sieburth and Pomeroy.[13] This apparent disagreement might be explained by the fact that the two studies employed different strains of the infectious agent.

SUMMARY

1) It has been established that the transmissible agent of bluecomb disease in turkeys will readily pass Berkefeld and Selas filters of the smallest pore size. These bacteria-free filtrates were as effective in reproducing the disease as was the original material.

2) Bacteria-free sintered glass filtrates produced definite but diminished evidence of infectivity.

3) The agent of bluecomb disease failed to pass the Seitz EK filter under the conditions outlined in these studies.

4) Evidence is presented which indicates that bacterial toxins are not the cause of this disease.

5) The disease can not be reproduced by inoculating poults with intestinal material from normal birds.

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## Edema Disease of Swine

Clinical and experimental evidence in Ireland, in 1950, suggested that edema disease was caused by a specific toxemia, either originating in the bowel or ingested as a preformed toxin. Since then, centrifuged supernatant fluid from the small intestine of a naturally affected pig has produced the disease after being stored for 11 months at 20 F. This supernatant fluid would produce the disease after being heated at 60 C. for 15 minutes but not after being heated at 65 C. for that period. The disease-producing factor was recovered from the small intestines of 12 of 18 affected pigs but not from the gastric content of these pigs.

An immune serum, produced from 2 pigs which were given a series of intraperitoneal and intramuscular inoculations with formolized supernatant fluid, protected 24 of 25 susceptible pigs, while 21 of 24 control pigs died. In a second experiment, the 4 principals given immune serum showed no evidence of the disease, while the 4 control pigs died.—*J. F. Timoney in Irish Vet. J., Nov., 1956.*

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*Mold Toxicosis in Swine.*—A condition diagnosed as mold toxicosis developed in several droves of swine while cleaning up corn fields in Georgia last fall. Necropsy in all cases showed large amounts of serous exudate in the pleural cavity, extensive pulmonary edema, ecchymoses of the endocardium, and hyperemia of the gastric mucosa. Cirrhosis of the liver and icterus, typical of the moldy corn syndrome, were absent. No other etiological agent was found.—*Georgia Vet., Dec., 1956.*

# Symposium* on Immunization Against Infectious Bronchitis Virus

## III. Infectious Bronchitis Control in Chickens

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THIS PAPER reports our experience and work, in Oregon, with the control of infectious bronchitis in chickens.

Since the first report[4] of a new respiratory disease of chicks in 1931, the widespread reports[1-3] which followed indicated that this highly contagious respiratory disease of chickens was widely distributed in the United States, especially those areas in which commercial poultry production was well established. During this period, there was no indication that infectious bronchitis had invaded the Oregon poultry industry, perhaps because the state was exporting poultry and their products rather than importing.

With the impact of World War II, the human population in Oregon rapidly increased and soon poultry production in the state could not meet local demands. Simultaneously, the nationwide demand for more animal protein also gave a tremendous impetus to that phenomenal enterprise known as the broiler industry. Consequently, Oregon's poultry industry found itself importing, especially in the field of broiler production. During the decade following 1940, "the respiratory disease complex," as it was commonly referred to, became not only complex but increasingly widespread.[5]

Perhaps a better understanding of the Oregon approach to infectious bronchitis will be made if a brief review of the Newcastle disease situation is given. The first case of Newcastle disease was encountered and diagnosed in Oregon chickens in January, 1947. The infection was traced directly to an importation of 10 New Hampshire cockerels that had just recovered, according to the supplier, from bronchitis. Later, in 1947 and 1948, other cases of Newcastle disease were diagnosed in imported birds or in local birds that had been exposed to imported birds. To carry out a survey of the incidence of Newcastle disease in Oregon flocks, a program of sampling blood serums submitted for the pullorum test has been carried out each year by submitting samples to the hemagglutination-inhibition test for Newcastle disease. These data have shown the incidence of Newcastle disease to be very limited and confined to rather restricted areas of poultry production. Because of this information, Newcastle disease live-virus vaccine is under official regulation and its use has been allowed under a restricted program in Oregon.

Because of the success of the Newcastle disease program, when infectious bronchitis started to become a general problem in 1952 to 1953, leaders of the poultry industry requested a similar program for infectious bronchitis control.

Most cases of infectious bronchitis observed have had a relatively mild effect on the birds. Mortality, even in very young chickens, has usually been of no significance. The most serious effect was evident in some flocks of laying birds. In about half of these flocks, not only a severe drop in egg production could be expected but also an effect on egg quality that would persist for months following recovery.

Salient points in the Oregon program for infectious bronchitis control are:

a) It is illegal to purchase or use the live-virus vaccine until permission has been obtained from the Oregon State Department of Agriculture.

b) The live-virus vaccine must be purchased from the Oregon State Department of Agriculture.

c) Before use of the live-virus vaccine is permitted on a farm or in a locality, there must be available accurate information concerning the presence and incidence of infectious bronchitis.

d) Poultry producers who feel they may have an infectious bronchitis problem and desire to vaccinate their birds are encouraged or required to have a determination made as to whether the disease has actually been in the birds on the place. A positive serum-neutralization test, virus isolation, or resistance to a challenge of a few birds have been methods used to diagnose the presence of infectious bronchitis in the flock.

From the Department of Veterinary Medicine, Oregon State College, Corvallis.

Presented before the Section on Poultry, Ninety-Third Annual Meeting, American Veterinary Medical Association, San Antonio, Texas, Oct. 15-18, 1956.

*Parts I and II of the Symposium appear in the April, 1957, issue of the "American Journal of Veterinary Research."

e) Poultry producers that are permitted to use the live-virus vaccine are requested to voluntarily quarantine their premises for three to four weeks following vaccination. The producer and personnel are requested to avoid visits to other poultry farms during this period.

f) Poultry producers are requested to do their own vaccination and to avoid the use of help from field servicemen. When vaccination instruction is needed it is supplied by the State Department of Agriculture personnel.

g) When it has seemed desirable to do so, personnel of the State Department of Agriculture investigate the premises of those requesting permission to vaccinate. This is for the purpose of designing suitable quarantine to protect other producers in the immediate area.

h) Emphasis has been placed on the importance of human beings as conveyors of infectious bronchitis infection. Experience indicates that once infection is introduced into a locality, possibly by carrier birds, that human beings are likely to be the most important factor of spreading the disease within the local area.

i) An effective educational program, supported by the poultry industry and its organizations and provided through the State Department of Agriculture and the Extension Service and Experiment Station of Oregon State College, has been most helpful in the program outlined. It is felt that only by a firm desire on the part of a large segment of the poultry producers to control the disease, as outlined, has it been possible to check the epizootics that occurred prior to this program.

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*Malignant Melanomas in a Horse.*—A gray (white) gelding, 20 years old, which had suffered from mild recurrent colic for several weeks, suddenly lost weight rapidly. For several months, subcutaneous nodules had been noticed over the neck, body, and submaxillary region, and one eye protruded. The subcutaneous lymphatic vessels were palpable, particularly in the neck region. On necropsy, uniform growths, about 1.0 to 1.5 cm. in diameter and grayish white on section, were found throughout the body, including the liver, mesentery, and heart wall. The greatly enlarged spleen contained several fibrous tumors 15 to 20 cm. in diameter, parts of which contained melanin. A tumor in the orbital fossa had caused the eye protrusion.—*J. Roy. Army Vet. Corps, Winter, 1956.*

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*Parenteral Coagulants in the Horse.*—A series of tests on 2 ponies (alternating them, at proper intervals, as principal and control) indicated that three commercial preparations containing oxalic and malonic acid (1%) did not reduce the clotting time of their blood, even at double the recommended dose (1.2 mg./kg.). The same was true of hemocoagulase, a product made from the venom of certain snakes.—*Vet. Rec., Jan. 19, 1957.*

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*Bedding for Small Pigs.*—The use of heat lamps, pig brooders, farrowing stalls, and the farrowing of pigs in the winter, has made it necessary to re-evaluate the proper bedding to use. In a recent study, corncobs ground in a hammer mill were most satisfactory, being the most absorptive and least dusty. Dry wood shavings were almost as good as cobs. Chopped straw was more dusty and chopped hay lacked the ability to absorb moisture. Long straw, because it piled up and absorbed moisture poorly, was the least desirable.—*Hoard's Dairyman, Feb. 25, 1957.*

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*A Pig's Tail (Tale).*—An owner complained that the tails of some of his pigs developed a scabby ring and dropped off, about ½ inch from the body, when the pigs were about 1 week old. When it proved not to be due to erysipelas, the heat lamps were blamed.—*Successful Farm., March, 1957.*

[This is seldom, if ever, due to erysipelas but what made it occur frequently before heat lamps were used.—W.A.A.]

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*Sulfonylurea Drugs May Replace Insulin.*—Sulfonamide-like compounds which can be given orally may replace insulin, which must be injected, for some diabetic patients. They are not bactericidal nor do they cause side reactions. The newest chemical in this group is called "tolbutamide" (orinase).—*Sci. News Letter, Feb. 23, 1957.*

# Nutrition

## Cafeteria-Feeding the Baby Chick*

E. E. CLORE, D.V.M.

*Greenwood, Indiana*

In 1949, a less expensive method of feeding baby chicks was tried. Since the chick does not require liquid milk, and thus differs from the pig and the calf, it was reasoned that there should be a better way to start chicks than feeding the balanced starting mash. With this thought in mind, the corn was separated from the ration, leaving the other ingredients which provided a 37 per cent protein supplement. The two were fed separately, free choice, with the chick doing the selective balancing.

The first problem was to make the 37 per cent protein supplement palatable and to fortify it with sufficient antibiotics and vitamins to meet the needs of the chick in those proportions in which corn and supplement were consumed.

At the outset, everyone consulted insisted that this "cafeteria"-feeding system would not be successful for chicks intended as replacement layers. However, during the first trials, it became apparent that the chicks varied the proportion of corn and supplement as they grew—the change was noticeable from week to week.

The chicks did not gain as rapidly as when given a broiler mash, but this was not a serious problem in pullets being raised for the laying flock. In fact, a somewhat slower growth was preferred, in order that the pullets would not come into production until they were at least 5 months old. Such pullets produced larger, better eggs throughout the laying season.

At first, the corn was ground fairly fine, but not powdered, and was placed in self-feeders, with plenty of space. The 37 per cent chicken supplement was made with expeller-type soybean meal (the oil contained in this product is helpful), meat scraps, alfalfa meal, all of the vitamins, and the needed antibiotics.

The alfalfa meal should be of the best quality and the quantity held to a minimum. The mineral should be the finest available and should contain all of the trace minerals. The minerals and vitamins should be included in the supplement in ample amounts to meet the requirements of the chicken as it changes its ratio of corn and supplement.

This method of feeding has a distinct advantage in that it allows the farmer to furnish his own corn and gives the chicken the advantage of making the proper selection as its body calls for grain and supplement.

All agree that a chicken's crop should contain no fiber, as chickens eat only as their crops become empty.

The ratio of corn to supplement during the chick's first week should be 1.5:1.0 and should gradually widen, up to 7:1 in some instances, by the time the chicken reaches 4 months of age. When the pullet starts to lay, the ratio drops to 5:1 until 80 per cent production is reached, when it is about 4:1. When the peak of production is over and the bird falls back to 70 per cent production, the ratio again is 5:1.

The average ratio from the time the birds lay the first eggs until a year of laying is completed is approximately 5:1.

Whole oats should not be fed free choice during the laying year but may be fed free choice until the birds start to lay. If fed to laying hens, no more oats should be fed than they will clean up before going to roost.

With this method of feeding, eggs can be produced for as low as 15 cents a dozen.

*Prepared by Dr. E. E. Clore, Greenwood, Ind., in cooperation with the American Association of Veterinary Nutritionists.

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*Effect of Salt in Ration of Chicks.*—A flock of unthrifty chicks with high mortality and retarded sex development, in Norway, was found to be on a ration containing only 0.18 per cent salt. They responded immediately to an increase in salt. Experiments indicated that growth improved as the salt content was increased to about 0.94 per cent of the ration. At 4 per cent, the birds were thrifty but showed increased thirst and produced soft droppings, but at 6.2 per cent, there was a high mortality and the carcasses were edematous. Egg production in hens was best when the salt level was 3.5 per cent of the ration.—*World's Poult. Sci. J., Oct., 1956.*

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When limestone was finely ground, it was eaten by heifers at a higher rate than when it was medium or coarsely ground, whether it was fed alone, with an equal part of salt, or with equal parts of steamed bone meal and salt.—*J. Anim. Sci.* (*Nov., 1956*) : 1238.

# The Veterinary Extension Service and Public Relations

GUEST EDITORIAL

The veterinary profession, like other specialized groups, is in constant need of improved public relations, not only with livestock producers and their organizations, but with other client groups and the public in general. A noted veterinarian, in an analysis of his colleagues, once stated: "The average veterinarian is an individualist—he constantly works alone; his surgery or diagnosis, his conclusions, his bookkeeping and office management—in fact, all of his endeavors, he handles himself. Thus, in a short time he fails to work with groups because he is so busy with his individual problems and decisions." This may contribute to poor public relations.

The greatest public relations medium is education. When the problems and pursuits of any individual or any group is understood, the basis for better relationships is established. One of the weakest links in our public relations program is our frequent failure to work closely with livestock organizations, the feed industry, and other groups interested in the welfare of the nation's animals. These groups have increased in number and size until they are a definite factor in determining the livestock producers' welfare.

One of the groups within our profession that has been making steady progress in developing a working relationship with agricultural agencies is extension veterinarians, whose cooperation is usually welcomed since they have nothing to sell except veterinary medicine.

Although less than one half of the states have extension veterinarians, extension services are available in every state and for all fields pertaining to agriculture. Veterinary medicine should be included in this broad educational program.

### The Extension Veterinarian

The role of the extension veterinarian is not to make veterinarians out of livestock producers but to acquaint them with the tremendous potential for aid from veterinary medicine, with emphasis on disease prevention. Educational meetings with the livestock producer are a necessity because, in their absence, other groups with entirely different motives will be holding such meetings. Extension services also help the veterinarian directly through refresher courses and ethical publicity.

Of great importance, in the over-all educational program on livestock disease control, is the development of a working relationship with county extension directors or farm advisors. They are the leaders of agricultural educational programs in their respective counties and, in most cases, welcome the cooperation and guidance of veterinarians in developing these programs, particularly those having a relationship to disease. When such cooperation does not exist, the extension veterinarian should attempt to develop it.

In the states which do not have an extension veterinarian, the state associations should confer with state directors of extension and officials of veterinary schools or departments about acquiring one. Such positions can be created in most states by adjusting budgets.

As a profession, we must constantly adjust ourselves to the changes in agriculture. Extension veterinarians are in a position to aid the profession in accomplishing this important task.—*John B. Herrick, D.V.M., Ames, Iowa.*

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## An Intriguing Theory on Abortion

While leptospiras are often found in aborted pigs, most research workers have been unable to find direct evidence of leptospiral infection in fetuses aborted by cows with leptospirosis (*see* p. 346). Usually, it is assumed that the leptospiras invade the fetus during leptospiremia in the cow and, after the death of the fetus, are destroyed in the decomposing tissues.

However, Ferguson *et al.* have proposed (*Am. J. Vet. Res.*, Jan., 1957: 43-49) that leptospiras do not cross the bovine placental barrier, but that the fetal death is caused by "a toxic substance released [in the cow] . . . when large numbers of leptospiras are destroyed by developing antibodies"; also that this substance destroys erythrocytes, resulting in icterus in the dam and anoxia in the fetus.

Such a toxic substance may not exist but this proposal may stimulate research which could increase understanding of abortion in general. Many abortions remain unexplained, particularly those in the late stage of pregnancy in swine.

# Current Literature

## ABSTRACTS

### Studies on Pasteurella Multocida

Of 197 cultures of *Pasteurella multocida* isolated from cattle and swine in various parts of the world and serologically typed by the hemagglutination test, there was a predominance of types A and B from cattle. The type A strains were most frequently associated with pneumonia, whereas the type B strains were usually recovered from animals with epizootic pasteurellosis. The latter cultures were, for the most part, recovered from cattle in tropical and subtropical countries. The type A strains were more prevalent in the countries with a temperate climate.

The strains from swine were predominantly types A and D. Secondary Pasteurella pneumonia was the most important disease condition associated with the isolations.

Recommendations are made in regard to the selection of serological types of *Past. multocida* for the preparation of bacterins and antiserums.

Fourteen bovine strains could not be typed.—[*G. R. Carter: Studies on Pasteurella Multocida. III. A Serological Survey of Bovine and Porcine Strains from Various Parts of the World. Am. J. Vet. Res., 18, (April, 1957): 437-440.*]

### Vibrionic Abortion in Sheep

Two experiments, using 393 ewes, were conducted. In experiment 1, ewes of lots 1 and 3 were bred to clean rams, and ewes of lot 2 were bred to infected rams. At the beginning of the fifth month of gestation, each ewe of lot 3 was fed forcibly approximately 40 Gm. of ovine fetal tissue infected with *Vibrio fetus*. No abortions occurred in ewes of lots 1 and 2, while 73.9 per cent of the ewes of lot 3 aborted.

In experiment 2, 241 ewes were arranged to form nine lots. One lot of normal ewes fed ovine fetal tissue infected with *V. fetus* at the beginning of the fifth month of gestation presented a significantly higher rate of abortion than did similar lots of ewes fed either culture of *V. fetus*, bacteria-free infected tissue filtrate, manure from an infected lot, or bovine fetal tissue infected with *V. fetus*.

Ewes which aborted from vibriosis during the previous year, and ewes which were fed infected ovine fetal tissue prior to pregnancy, were immune when challenged by oral inoculation with infected ovine fetal tissue during the fifth month of gestation.—[*Rue Jensen, V. A. Miller, M. A. Hammarlund, and W. R. Graham: Vibrionic Abortion in Sheep. I. Transmission and Immunity. Am. J. Vet. Res., 18, (April, 1957): 326-329.*]

## BOOKS AND REPORTS

### Brucellosis—A Monograph of the Oswaldo Cruz Institute

This is the first book written in Portuguese covering all the various aspects of brucellosis. Of particular interest is an extensive chapter especially devoted to animal brucellosis, pointing out the highlights on etiology, geographical distribution, epidemiology, economic importance, pathology, treatment, and a detailed discussion on prophylaxis.

It contains a wealth of information on the cultural characteristics, physiology, antigenicity, and resistance to physico-chemical agents of the organism. Differentiation of the different species or types of Brucella is intensively discussed.

Of special interest are the numerous and excellent photomicrographs of lesions of the nervous tissue. An explanation for the totality of the clinical forms of brucellosis is found in the distribution and localization of the organisms, especially in the reticuloendothelial system. Inflammatory phenomena, functional disturbances, and partial destruction of the organic parenchyma account for the clinical signs observed in this disease.

The radiographs, illustrations, and case histories presented in discussing pulmonary, osteo-articular, spondilitis, and cutaneous brucellosis are well selected.

The extensive chapter on treatment of brucellosis in man credits chlortetracycline alone, and oxytetracycline in combination with streptomycin, as effective in controlling the infection.

Besides the references at the end of each chapter, there is a 60-page bibliography. This book merits translating into other languages.—[*Brucellosis. By Genesio Pacheco and Milton Thiago de Mello. 727 pages. 166 figures (8 colored). 83 tables. Servico Grafico do Instituto Brasileiro de Geografia e Estatistica, Rio de Janeiro, Brazil. Monographies of the Oswaldo Cruz Institute. No. 7, September, 1955. Price not given.*]—O. A. LOPEZ-PACHECO.

### Encyclopedia of Animal Care

The authors have succeeded in giving information in simple but accurate language on the anatomy and physiology of domestic animals and making clear how the normal functions may be altered by attacks of specific systemic diseases. This would enable the owner to give rational first-aid treatment preparatory to the skilled attention to be given later by the veterinary practitioner to whom the case is referred.

Proprietary remedies are rarely mentioned. The intent of the authors is that the book will be useful to the farmer and livestock owner. It is indeed encyclopedic, and the more than 1,000 pages contain a wealth of information for the student of animal husbandry. It could also serve a useful purpose for the busy practitioner, placed on the table in his office or waiting room where he could use it as a hasty reference for a waiting client.—[*Encyclopedia of Animal Care. By William C. Miller and Geoffrey P. West. 4th ed. 1080 pages. Williams and Wilkins Co., Mt. Royal and Guilford Aves., Baltimore 2, Md. 1956. Price $9.00.*]—CHARLES MURRAY.

## Symposium on Leptospirosis

On April 25, a symposium on leptospirosis will be held at the University of Kansas Medical Center, in Kansas City, for physicians and veterinarians.

The worldwide and apparently increasing morbidity of leptospirosis, in both man and animals, has aroused considerable interest in this disease. This interprofessional symposium presents the current concepts related to this disease. The guest faculty includes physicians, veterinarians, public health personnel, and scientists.

Following is the program:

**THURSDAY, APRIL 25**

8:00 Registration.

**Dr. Michael L. Furcolow, presiding**

8:45 Welcome—Dr. W. Clarke Wescoe.
Welcome—Dr. K. Maynard Curts.
Welcome—Dr. Lewis H. Hoyle.
Purpose of Symposium—Dr. Michael L. Furcolow.

9:00 Leptospirosis as a World Problem—Dr. James H. Steele.

9:30 Microbiology and Classification of the Leptospira—Lt. Colonel William S. Gochenour, Jr.

9:55 Epidemiological and Public Health Aspects of Leptospirosis—Dr. Fred R. McCrumb, Jr.

10:15 The Military Significance of Leptospirosis—Lt. Colonel Leslie C. Murphy.

10:35 Coffee.

10:55 Leptospirosis of Domestic Livestock—Dr. Harold S. Bryan.

11:15 Leptospirosis of Pet Animals—Dr. Jacob E. Mosier.

11:35 The Sylvatic and Ecological Aspects of Leptospirosis—Dr. Herbert G. Stoenner.

11:55 The Clinical Aspects of Human Leptospirosis:
*a*) The Typical Case of Weil's Disease—Dr. Theodore E. Woodward.
*b*) Clinical Manifestations of Milder Forms—Dr. Joe L. Stockard.

12:40 Luncheon.

**Dr. A. H. Quin, presiding**

1:30 The Pathology of Leptospirosis:
*a*) In Man—Dr. John T. Logue.
*b*) In Animals—Dr. Marvin J. Twiehaus.

2:00 Laboratory Diagnosis of Leptospirosis—Dr. Herbert G. Stoenner and Lt. Colonel William S. Gochenour, Jr.

2:30 The Immunology and Prophylaxis of Leptospirosis—Dr. Charles J. York.

3:30 The Treatment of Leptospirosis:
*a*) In Man—Dr. Joe L. Stockard.
*b*) In Animals—Dr. Jacob E. Mosier.

3:40 Coffee.

4:00 Panel Discussion (all faculty participating)—Lt. Colonel William S. Gochenour, Jr., moderator.

## Tribute to the Nation's Veterinarians

The following comments, made on the Senate Floor by the Honorable Alexander Wiley, U. S. Senator from Wisconsin, are reprinted because of their interest to JOURNAL readers. The full text of Senator Wiley's remarks were printed in the February 1 issue of the *Federal Register*:

MR. WILEY: "Mr. President, I should like to call to the attention of my colleagues a fine group of professional men who, largely unknown and unheralded, are making a great contribution to the health and welfare of our country. They are the veterinarians of America.

"Too often, unfortunately, in this mechanical, jet-atomic age our vast resources in animal life, in which the "vets"—as we familiarly know them—perform their tasks, are relegated to the background in the thinking of some people. This is unfortunate; for, as we should know, both milk from our cows and meat from animals and fowl represent indispensable items in the American diet.

"As we know, too, the 'vets' are fighters in the front ranks of our battles to eliminate disease from animal and fowl life. Guardians of our health, not only have they been busy in eliminating diseases from our domestic herds and flocks, but they have contributed greatly toward keeping some of the world's worst diseases from our shores.

"In Wisconsin, America's Dairyland, we are justly proud that—due largely to our hard-working veterinarians and the outstanding cooperation of our agriculturalists—our Badger State has been declared modified certified brucellosis free. In addition, we have made great strides in the conquering of mastitis, and other diseases of animal life. Recently a State veterinarian's conference at Madison emphasized the accomplishments of this fine group of servants on behalf of the public health. Moreover, tribute was paid to a great Wisconsinite, Dr. Harry J. O'Connell, our State veterinarian. He was named 'veterinarian of the year' by the Wisconsin Veterinary Medical Association.

"To give my colleagues the benefit of a resume of accomplishments not only by the veterinarians as a group, but of Dr. O'Connell's fine personal contribution, I request unanimous consent to have printed at this point in the *Record* two articles from the Milwaukee Journal of January 10 and January 11, stressing the achievement of veterinarians on behalf of the public health."

There being no objection, the articles were ordered to be printed in the *Record*.

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## Uruguay Association to Sponsor Veterinary Conference

Dr. Guillermo P. Lockhart, president of the Uruguayan Veterinary Medical Association, has forwarded announcement of a conference of the veterinary medical profession which will be held in Montevideo, Uruguay, May 6-10, 1957, as part of the celebration of the fiftieth

anniversary of the founding of the Uruguay association.

Veterinarians in the United States and other American countries are cordially invited to attend the conference, also to submit papers of veterinary interest for the program. Anyone wishing to submit articles should address correspondence to: Organizing Committee, Second National Conference of Veterinarians, Avenida Agraciada 1464, piso 14, Montevideo, Uruguay, S. A.

### Dr. Baker Receives Gaines Award

**Dr. James A. Baker, director of the Cornell Research Laboratory for Diseases of Dogs, Ithaca, N. Y., is the 1956 recipient of the Gaines Dog Research Center award as "Dogdom's Man of the Year."**

**The award was presented to Dr. Baker by Mr. Harry Miller, director of the Gaines Dog Research Center, on Feb. 12, 1956, at the Park Sheraton Hotel, New York City.**

### U.C.L.A. Course Presented

Recent information in the fields of virology, parasitology, and mycology of practical value to the veterinary clinician was presented in a special course in "Veterinary Virology, Parasitology, and Mycology" which the Medical Extension and the School of Medicine at U.C.L.A. held on March 7 through April 25.

Bennett J. Cohen, D.V.M., was chairman of the course which was open to graduates of approved schools of veterinary medicine.

**Be sure to advise the AVMA of a change of address**

## AMONG THE STATES AND PROVINCES

### Alabama

**State Association.**—The fiftieth annual convention of the Alabama Veterinary Medical Association was held March 17-19, 1957, at the Lyons Hotel, Decatur. Past-presidents were recognized and certificates of service were issued to those present.

Out-of-state speakers included Drs. James Archibald, head, Small Animal Division, Ontario Veterinary College, Guelph, Canada; W. W. Armistead, president-elect of the AVMA, dean, School of Veterinary Medicine, Texas A. & M. College; F. R. Booth, chairman, AVMA Committee on Ethics, Elkhart, Ind.; F. G. Fielder, Schering Corporation, Bloomfield, N. J.; J. W. Newberne, Pitman-Moore Co., Indianapolis, Ind.; and C. K. Mingle, chief, brucellosis eradication section, Washington, D. C.

s/M. K. HEATH, *Secretary.*

### Alberta

**State Association.**—The *Alberta Veterinary News* reports that the public information broadcasts prepared by members of the Alberta V.M.A. are being very well received by the farm broadcast directors in the Province of Alberta. Twelve stations have indicated that they wish to carry the interviews on their programs. Fourteen interviews were in the initial release, an additional four transcribed interviews have been prepared and were released in March, and plans are under way to transcribe an additional six programs this month.

### Arizona

**Southern Association.**—At the January meeting of the Southern Arizona V.M.A., the following officers were elected for the 1957 term: A. A. Budurin, president; W. K. Lee, president-elect; and Gwyn Chapin, secretary-treasurer.

### California

**Alameda-Contra Costa Association.**—The Alameda-Contra Costa Veterinary Medical Association met Feb. 27, 1957, at the Seawolf Restaurant, Oakland. Mr. E. R. Coarr, Abbott Laboratories, presented a paper on radioactive materials.

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**Disease Control Examinations.**—The California State Personnel Board has announced the examination for the employment of veterinarians in disease control and pathology and meat and poultry hygiene for the State of California.

Examinations will be held each month starting April 30 through Dec. 30, 1957. The salary range is from $505 to $613 a month.

California residence is not required for the examination; however, a valid license issued by the Board of Examiners in Veterinary Medicine in the State of California to practice must be secured within 12 months of the date of appointment for veterinarians engaged in disease control and pathology.

The examination will be given in such places in California and other states as the number of candidates warrant and conditions permit.

Applications are obtainable from the State Personnel Board in Sacramento, San Francisco, and Los Angeles and at the local office of the California Department of Employment.

## Connecticut

**State Association.**—The annual meeting of the Connecticut V.M.A. was held at the Hotel Bond, Hartford, on Feb. 6, 1957, with 80 members attending.

The following officers were elected for the ensuing term: Alvin R. McDonald, Bloomfield, president; Chester E. Guthrie, Wilton, first vice-president; Ralph V. Westerberg, Elmwood, second vice-president; and Ernest H. Patchen, Milford, secretary-treasurer.

Following the business meeting, an illustrated paper on canine orthopedics was presented by Dr. Peter Olsan, Wilton.

## Florida

**State Board Examination.**—The Florida State Board Examination will be held June 17-19, 1957, at the Everglades Hotel, Miami. Application deadline is June 1, 1957. Address inquiries to Dr. E. L. Matthews, P.O. Box 141, Palatka, Fla., secretary-treasurer.

## Illinois

**Dr. Jaffray Named Veterinarian of the Year.**—Dr. John B. Jaffray (CVC '03), Chicago veterinarian who began practice more than a half century ago, was named "Illinois Veterinarian of the Year" at the seventy-fifth (Diamond Jubilee) meeting of the Illinois V.M.A. in Chicago, Feb. 24-27, 1957. Presentation of a plaque signifying the honor was made by Dr. A. E. Bott, chairman of the association's executive board, during the annual banquet. At the same time, Dr. Jaffray and 15 other veterinarians were awarded 50-year pins in token of 50 or more years of membership in the state association and their long-time support of and contributions to the profession.

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**Public Health Association to Meet.**—The seventeenth annual conference of the Illinois Public Health Association will be held at the Edgewater Beach Hotel, Chicago, Wednesday and Thursday, April 24-25, 1957.

A symposium on "Newer Developments in Food Preservation" is scheduled for Thursday morning, April 25.

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**Southern V.M.A. Women's Auxiliary.**—The Auxiliary to the Southern Illinois V.M.A. met at Benton on Dec. 6, 1956. The business meeting, held at the home of Mrs. R. J. Wells, was conducted by Mrs. A. W. Doughty, vice-president.

Officers for the coming year are Mrs. A. W. Doughty, president; Mrs. C. H. Rogers, vice-president; and Mrs. R. D. Shilliday, secretary.

S/MRS. C. H. HORSTMAN, *Acting Secretary.*

## Indiana

**Michiana Association.**—Officers of the Michiana Veterinary Medical Association elected for the next year are Drs. Bruce Hostrawser, South Bend, president; R. W. Worley, South Bend, president-elect; J. W. Carter, Elkhart, vice-president; and Stanton Williamson, South Bend, secretary-treasurer.

The regular meeting of the Michiana V.M.A. will be held in South Bend, Ind., May 9, 1957. The program speaker for the evening will be Dr. T. H. Brasmer, practitioner, Danville, Ill.

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Dr. John B. Jaffray (left) accepting plaque from Dr. A. E. Bott at Illinois V.M.A. seventy-fifth meeting in Chicago.

Officers of the Women's Auxiliary to the Michiana V.M.A., Elected at Their February Meeting

Left to right—Mrs. R. W. Worley, South Bend, president; Mrs. L. D. Ramsay, LaPorte, vice-president; Mrs. R. E. Schaub, New Carlisle, secretary; and Mrs. A. C. DuFour, Elkhart, treasurer.

**Central Association.**—At a meeting of the Central Indiana V.M.A., held on Feb. 13, 1957, at the Charcoal Steak House, Indianapolis, the following officers, all of Indianapolis, were elected for the ensuing term: John Templeton, president; William Tornes, vice-president; Peter Johnson, secretary-treasurer; and Charles Stengle, program director.

The 27 veterinarians who attended heard a paper presented by Dr. John Bardens on the pharmacology and uses of chlorpromazine.

## Iowa

**Dr. Butterworth Contributes to Achievement Fund.**—Dr. James R. Butterworth (ISC '37) of Highland Park, Ill., recently made a sizeable cash contribution to the Clarence Covault Distinguished Professorship Fund of the Alumni Achievement Fund at Iowa State College, as a mark of appreciation.

## Kansas

**Women's Auxiliary.**—The twenty-second meeting of the Women's Auxiliary to the Kansas V.M.A. was held in Salina on Feb. 7, 1957. At a business meeting, at which Mrs. Robert Bogue, president, presided, the following officers were elected for the ensuing term: Mrs. J. C. Symns, president; Mrs. Mohney, vice-president; Mrs. Dan Upson, secretary-treasurer; Mrs. F. B. Ogilvie, historian.

At the second business session, Mrs. Leisure, delegate to the Women's Auxiliary to the AVMA annual meeting in San Antonio, gave her report. Mrs. K. M. Curts reported that we have 84 paid state members, 33 honorary members, and 61 paid AVMA auxiliary members (paid to her). Mrs. Jay Rush reported on the Women's Auxiliary to the student chapter of the AVMA.

Mrs. Curts was appointed delegate to the AVMA Women's Auxiliary convention in Cleveland in August. Mrs. Bogue was appointed as the alternate.

s/(MRS. DAN W.) MARIAN H. UPSON,
*Secretary.*

## Kentucky

**Central Association.**—The Central Kentucky V.M.A. met in Lexington, Feb. 6, 1957. Thirty-one members of the Association and 36 guests were in attendance.

Dr. Byron Bernard of the Cincinnati Zoo was the guest speaker and a part of his presentation consisted of a movie taken of his 1956 trip to the Belgian Congo, in connection with his duties at the Cincinnati Zoo.

A talk entitled "A Look in to the Future" was presented by Dr. Stanley A. Vezey, American Cyanamid Company.

This meeting of the Central Kentucky V.M.A. was a dinner meeting and was preceded by a cocktail hour sponsored by Mr. Joe Warren, a Lexington, Ky., pharmacist.

The 1956-1957 officers of the Central Kentucky V.M.A. are Robert E. Lee, president; Linwood S. Shirrel, vice-president; and John W. Finlay, secretary-treasurer.

## Louisiana

**Dalrymple Memorial Laboratory at Louisiana State University. At right is front entrance of original building dedicated in February, 1931. The left wing is the recently constructed addition.**

**Some of the animal holding quarters in the Department of Veterinary Science, Louisiana State University.**

### Massachusetts

**State Association.**—The first of the 1957-1958 series of meetings of the Massachusetts Veterinary Association was held Wednesday, March 20, 1957, in Worcester.

The program included a practitioners' panel on distemper led by Dr. Herbert M. Tabbut. Participants were Drs. Harrison B. Siegle, M. Terry Mills, Joseph M. Stoyak, and Ralph Povar. A paper on the producers' outlook on distemper vaccination was presented by Dr. George Ott, Fromm Laboratories, Grafton, Wis., and Dr. C. E. DeCamp, Pitman-Moore Company, New York.

s/MORTON WOLF, *Secretary.*

### Michigan

**Mrs. Bryan Dies.**—Mrs. C. S. Bryan, widow of the late Claude S. Bryan, former dean of the College of Veterinary Medicine, M.S.U., died in East Lansing, Mich., Feb. 5, 1957. Surviving are two daughters: Marjorie, 19, and Nelda, 17.

### Minnesota

**State Association.**—The Minnesota State Veterinary Medical Association held its annual meeting in Minneapolis in January, 1957. The following officers were elected for the coming year: Drs. H. E. Schwermann, New Ulm, president; C. C. Hartle, Minneapolis, president-elect; Glen Helson, New Richland, first vice-president; R. S. Kufrin, Benson, second vice-president; and B. S. Pomeroy, St. Paul, secretary-treasurer. Members elected to life membership included: Drs. C. Cherry, Redwood Falls; E. L. Burschenritter, Virginia; R. W. Myers, Owatonna; P. H. Riede, Mabel; and A. C. Spannous, Waconia. Mr. Sames Olson, Austin, vice-president of Hormel and Co., was elected to honorary membership.

### Missouri

**Dr. Quin Named Veterinarian of the Year.**—Dr. Abner H. Quin, vice-president and director of Jensen-Salsbery Laboratories, was named "Missouri Veterinarian of the Year" by the Missouri Veterinary Medical Association at the banquet concluding the association's annual two-day meeting.

• • •

**Kansas City Association.**—The February meeting of the Kansas City V.M.A. was held in the Livestock Exchange Building, Kansas City, Feb. 19, 1957.

The meeting was divided into a large animal section, at which the speaker, Dr. Roland King from the staff of Jen-Sal Laboratories, presented a talk on swine practice; and small animal section, the film "Applications and Indications of Some New Drugs and How They are Made" was presented by Mr. Wyane Lieser of the Upjohn Company.

### Nevada

**State Association.**—The annual meeting of the Nevada State V.M.A. was held in Elko on Feb. 15-16, 1957. Speakers appearing on the program from out of the state were Drs. Donald E. Barr, Fresno, Calif.; J. A. Arburua, AVMA representative, San Francisco, Calif.; Mel Horning, Alturas, Calif.; H. M. Mencimer, Ogden, Utah; and Mr. A. Weaver, Pitman-Moore representative, Boise, Idaho.

The following officers were elected for 1957: Drs. Francis E. Neville, Winnemucca, president; M. L. Houston, Yerington, vice-president; and J. B. Key, Tonopah, secretary-treasurer.

s/W. F. FISHER.

### New Jersey

**Women's Auxiliary.**—The annual meeting of the Women's Auxiliary to the Veterinary Medical Association of New Jersey was held on Feb. 13, 1957, at the Berkeley Carteret Hotel, Asbury Park, N.J. The guest of honor was Mrs. Alfred E. Coombs, president of the Women's Auxiliary to the AVMA, who gave an interesting talk on the Student Loan Fund.

The following officers were elected: president, Mrs. Owen K. Fox, Mt. Holly; first vice-president, Mrs. Lester Barto, Basking Ridge; second vice-president, Mrs. Clarence J. Chehayl, Westfield; secretary, Mrs. A. F. North, Jr., Somerville; and treasurer, Mrs. Lloyd Sanders, Dover.

The members voted to send $35 to the AVMA Student Loan Fund and $25 to the AVMA Research Fund.

Mrs. Lloyd Sanders of Dover was appointed delegate and Mrs. G. H. Kimnach of Highstown, alternate, to the AVMA, 1957 convention in Cleveland.

s/MRS. A. F. NORTH, JR., *Secretary.*

### New York

**New York City Association.**—The Veterinary Medical Association of New York City held its regular meeting on the evening of Wednesday, March 6, 1957, at the New York Academy of Sciences, New York City.

The program consisted of a talk by Dr. Jack O. Knowles, small animal practitioner, Miami, Fla., on "Plastic Surgery in Dogs."

### North Carolina

**Eastern Association.**—At the December, 1956, regular meeting of the Eastern North Carolina V.M.A. held at Raleigh, N. Car., the following were elected to serve for the year, 1957: Drs. Earl Knox, Raleigh, president; W. E. Plummer, Goldsboro, vice-president; and Byron H. Brow, Goldsboro, secretary-treasurer.

### North Dakota

**Short Course for Veterinarians.**—The annual short course for veterinarians was held in the

Van Es Laboratory at the North Dakota Agricultural College, Fargo, on Feb. 13-14, 1957.

The faculty included Drs. W. E. Peterson, St. Paul, Minn.; J. D. Trace, Fort Dodge, Iowa; G. F. Larson, Breckenridge, Minn.; T. R. Myers, Bismarck, N. Dak.; I. A. Schipper, Fargo; F. M. Bolin, Fargo; D. F. Eveleth, Fargo; and Mr. R. F. Schumard, Mr. A. G. Hazen, Mr. W. Dinusson, Mr. C. J. Jensen, Mr. M. L. Buchanan, Mr. George Strum, and Mr. Clarence Olson, all of the North Dakota Agricultural College, Fargo.

s/DEAN E. FLAGG, *Secretary.*

## Oklahoma

**State Board Examination.**—The next meeting of the Oklahoma Board of Veterinary Medical Examiners, for the purpose of giving examinations for license, will be held at the School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, on May 20-22, 1957.

Requests for information should be addressed to Raymond E. Henry, Oklahoma State Board of Veterinary Medical Examiners, Oklahoma City, Okla.

## South Carolina

**State Association.**—The South Carolina Association of Veterinarians met for the annual business meeting on Jan. 19, 1957, at the Hotel Columbia, Columbia.

The following men appeared on the program: Dr. R. L. Williams, president of the North Carolina V.M.A., Raleigh, and a representative of the Mutual Insurance Company of New York. The president, Dr. W. R. Beasley, Batesburg, presided. The business meeting was followed by a cocktail party and banquet.

The following officers were elected for the coming year: Drs. T. E. Brown, Spartanburg, president; George Smith, Greenville, president-elect; T. M. Rhodes, Charleston, vice-president; Worth Lanier, York, secretary-treasurer; F. P. Caughman, Sr., Columbia, examining board; and Herbert Riddle, Greenville, executive committee.

## South Dakota

**State Board Examinations.**—The South Dakota State Board Examination, to practice veterinary medicine and surgery, will be given on June 24-25, 1957. All applications must be received by May 25, 1957, and must be accompanied by a $10 check or money order made payable to the South Dakota Livestock Sanitary Board.

For applications and additional information, write to Glenn B. Rea, executive secretary, Livestock Sanitary Board, State Office Building, Pierre, S. Dak.

## Utah

**Intermountain V.M.A. Women's Auxiliary.**—The Women's Auxiliary to the Intermountain V.M.A. met on Jan. 24-26, 1957, at the Hotel Utah, Salt Lake City, with Mrs. George Glover,

Mrs. Grant Boam, President

Torrington, Wyo., presiding. Fifty-eight members and one guest registered.

Newly elected officers for 1957 are Mrs. Grant Boam, Salt Lake City, president; Mrs. James Bailey, Moscow, Idaho, first vice-president; Mrs. Howard Ingram, Montrose, Colo., second vice-president; Mrs. Jack Palmer, Salt Lake City, secretary-treasurer; and Mrs. George Good, Wheatland, Wyo., delegate.

The business meeting included a report from Mrs. Wayne Binns, Logan, Utah, on the meeting of the AVMA Women's Auxiliary in San Antonio last October, and an interesting talk by Mrs. Lloyd Moss, Fort Collins, Colo., on her recent world travels. The decision was reached to send $10 to the following: Student Loan, Award, Research, Memorial, and General funds. The Memorial Fund is in memory of Drs. Dale Thornburg, Warren Earl, Lee Seghetti, and James Ellis.

s/MRS. DOUGLAS MCKELVIE
SALT LAKE CITY, UTAH.

## Virginia

**State Association.**—Officers of the Virginia Veterinary Medical Association elected at the annual meeting, Jan. 27-29, 1957, include Drs. J. B. Ely, president; A. W. Rice, president-elect; G. H. Brumble, Jr., vice-president; and G. B. Estes, secretary-treasurer.

## West Virginia

**Women's Auxiliary.**—The Women's Auxiliary to the West Virginia V.M.A. met at the Greenbrier Hotel, White Sulfur Springs, for its winter meeting on Feb. 3-4, 1957. Dr. and Mrs. S. F. Scheidy, West Point, Pa., showed

slides that they had taken at AVMA convention in San Antonio last October.

s/MRS. THOMAS P. FROM, *Secretary.*

### Wisconsin

**Dr. Donovan's Fifty Years in Wisconsin.**—Dr. L. T. Donovan's fifty years of service to Wisconsin agriculture was recognized through a picture and story appearing in the Waupun Leader News.

The article pointed out that Dr. Donovan received his veterinary degree from Chicago Veterinary College, March 29, 1907, and that all of the intervening fifty years have been spent in Waupun.

Of interest is Dr. Donovan's comment that he is making no plans for immediate retirement. The article states, "For any one who loves his work as much as he does, retirement is not something to look forward to. As long as he is able, he will continue his practice."

## FOREIGN NEWS

### Russia

**Veterinary Correspondence School.**—The Moscow Veterinary Academy has opened a correspondence school of higher veterinary education. Admission is limited to 300 veterinary technicians who have had at least three years of experience since graduation from a veterinary technical high school. The six-year course leads to certification as a veterinarian. The students are given two months' leave from their jobs each year to attend a laboratory and examination session.

s/ROBERT E. HABEL.

## STATE BOARD EXAMINATIONS

FLORIDA—June 17-19, 1957, Miami. E. L. Matthews, P.O. Box 141, Palatka, Fla., secretary.

NEW YORK—June 12-13, 1957. Practical examination, Ithaca. Mr. James O. Hoyle, secretary, 23 S. Pearl St., Albany. Week of July 8, 1957. Written examinations: New York City, Albany, Syracuse, Buffalo, Rochester.

NORTH CAROLINA—June 24-26, 1957. Asheville. Dr. James I. Cornwell, secretary, 65 Beverly Road, Beverly Hills, Asheville.

OHIO—June 4-5, 1957. Columbus. H. G. Geyer, Office of the Secretary Ex-Officio, Division of Animal Industry, Room 720, State Office Building, Columbus 15, Ohio.

OKLAHOMA—May 20-22, 1957, Stillwater. R. E. Henry, Oklahoma Board of Veterinary Medical Examiners, Oklahoma City, Okla., secretary.

SOUTH DAKOTA—June 24-25, 1957. Pierre, Glenn B. Rea, Livestock Sanitary Board, State Office Building, Pierre, S. Dak., secretary.

TENNESSEE—June 24-25, 1957. Nashville. Dr. W. O. Greene, secretary, State Office Bldg., Nashville.

TEXAS—June 3-4, 1957. College Station. Mr. T. D. Weaver, executive secretary, Texas State Board of Veterinary Medical Examiners, 207 Capital National Building, Austin 16, Texas.

## DEATHS

Star indicates member of AVMA

★**Alexander E. Wight** (HAR '97), 81, died in Washington, D. C., on March 11, 1957. The former chief of the Tuberculosis Eradication Division of the Bureau of Animal Industry, U.S.D.A., and AVMA president in 1940-1941, had been in failing health for some time.

Dr. A. E. Wight

Born in Medfield, Mass., April 14, 1876, Dr. Wight received his preliminary education at the academy there before enrolling at Harvard University from which he received his M.D.V. degree in 1897. After a year of private practice, he went with the Bureau of Animal Industry in Boston, later served in South Dakota and Arkansas before being transferred to Washington in 1917. There he served under the late Dr. J. A. Kiernan before becoming head of the Tuberculosis Eradication Division in 1928. At that time, no state had a modified accredited status. When Dr. Wight retired in April, 1946, every state was accredited. Along with the work on bovine tuberculosis, he was in charge of brucellosis eradication.

He was a member of a number of professional and scientific organizations including the AVMA, which he joined in 1917, the U. S. Livestock Sanitary Association, and the District of Columbia V.M.A., in all of which he held office at one time or another.

Dr. Wight was a bachelor and is survived by a niece and nephew, both of Medfield, where burial services were conducted following funeral services in Washington on March 13.

**L. J. Allmaras** (MCK '16), New Rockford, N. Dak., died in November, 1956, of a heart attack.

**Bert R. Wilbur** (COR '03), 80, died recently. He served with the U.S. Department of Agriculture for 30 years until his retirement in 1936. Dr. Wilbur had been a member of the AVMA. His widow, a son, and two daughters survive.

**Others Deaths Reported.**—The following deaths have been reported. The usual information for an obituary was not supplied.

Franklin Allen (CVC '13), Craig, Neb.

A. V. Barbee (STJ '15), Siloam Springs, Ark.

Joseph Bodenheimer (ONT '14), Freeburn, Ky.

Walter Boyce (COR '11), Superior, Neb.

Alva B. Carter (ONT '92), Attica, Ind.

Robert Chrisman (UP '38), Phoenixville, Pa.

James Coberly (KVC '17), Mesa, Ariz.

Will Coleman (ONT '11), Corsicana, Texas.

Sterling H. Creighton (ONT '95), Coffey, Mo.

James Cullison (USC '03), Charleston, Mo.

Claude Cox (CVC '13), Watsonville, Calif.

Albert L. Deal (ONT '00), Beach City, Ohio.

James E. Ellis (KCV '03), Boise, Idaho.

William J. Freude (STJ '10), Dorchester, Neb.

Carl Gamrath (ISC '09), Fairfield, Iowa.

R. R. Gloyd (KCV '16), Butler, Mo.

Clinton Goodwin (USC '11), Pikesville, Md.

M. J. Hammond (CVC '08), Broughton, Kan.

John M. Handley (OSU '08), Thornville, Ohio.

Clarence J. Howard (IND '07), Carlisle, Ind.

Roy Huckleberry (IND '16), Whitestown, Ind.

Rufus T. Kennedy (OSU '11), Columbus, Ohio.

Christopher C. Kinsley (KVC '05), Oakley, Kan.

LeRoy D. Knight (AVC '14), Port Jervis, N.Y.

A. H. Kriens (KCV '18), Fontanelle, Iowa.

J. D. McGregor (ONT '88), Butte, Mont.

Jesse C. McKee (ONT '10), Litchfield, Minn.

James A. McLeish, Montreal, Que.

Charles D. McMurdo (AVC '89), San Jose, Calif.

Audry W. Miller (IND '13), St. Louis, Mo.

Thomas I. Miller (CVC '07), Decatur, Ill.

William J. Moersfelder (COR '23), Bronx, N.Y.

Burke E. Moore (USC '20), New Bern, N. Car.

John J. Morrow (ONT '08), Toronto, Ont.

Thomas Mosley (CVC '20), Lawton, Okla.

Jacob M. Murray (KSC '08), Goff, Kan.

Joseph Nicholson (ONT '94), Humboldt, Iowa.

Frank N. Niederwimer (WES '08), Montgomery City, Mo.

Albert G. Porter (TH '16), Dyer, Tenn.

Lonnie A. Ray (IND '12), Cloverdale, Ind.

Thomas R. Robertson (MCK '16), Dyersburg, Tenn.

Oscar Sandin (KCV '12), Plattsmouth, Neb.

Harry A. Schneider (UP '06), Harrisburg, Pa.

R. A. Shoemaker, Slater, Mo.

Leslie E. Smith (ISC '09), Jefferson, Iowa.

Winslow A. Snyder (KVC '15), East Greenville, Pa.

Van A. Potes (CVC '15), Detroit, Mich.

Clay E. Swisher (MCK '17), Cameron, W. Va.

Chauncey S. Underwood (KCV '15), Perry, Mo.

James E. Walker (ONT '11).

Fred A. Wolfe (KCV '10), Linneus, Mo.

Theophilus J. Wood (USC '10), Charlottesville, Va.

Leonard B Woods (CVC '10), Roodhouse, Ill.

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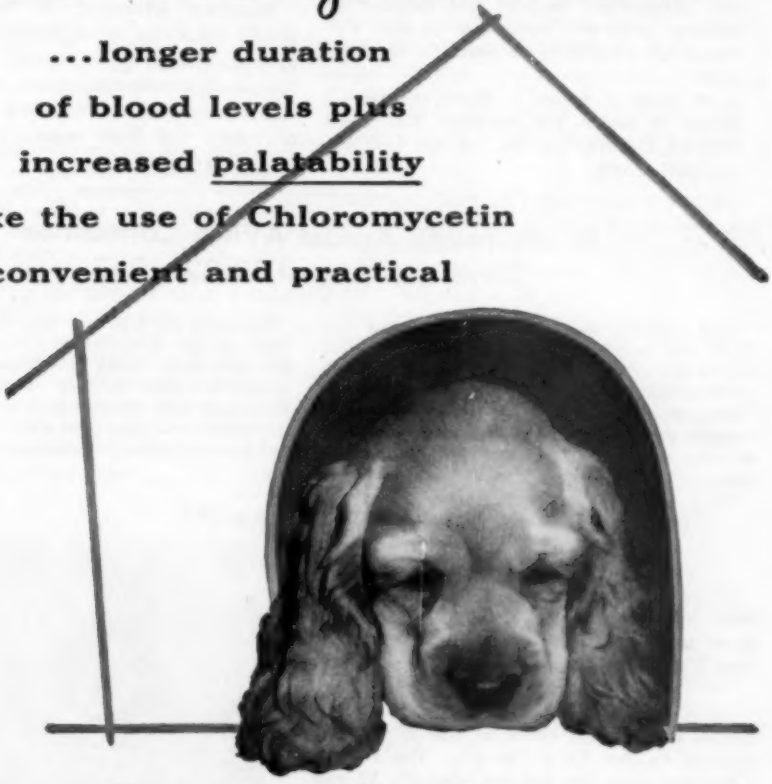

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Department of Veterinary Medicine
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## ORGANIZATION SECTION

### AVMA Group Insurance Program Becomes Effective May 1, 1957

The initial enrollment period will end on April 30, 1957, and the group enrollment privileges will be withdrawn on that date.

This means that members wishing to secure AVMA health and accident, group life, catastrophe hospital and surgical insurance after this date must present evidence of insurability to enroll in the program.

At time of going to press, nearly all states in which the program has been offered are meeting the 50 per cent enrollment quota.

Should certain states fail to enroll 50 per cent of their eligible members prior to May 1, the insurance company reserves the right to reject applications from members they consider uninsurable in those states.

Members interested in the program should not delay in submitting their applications—*the deadline is April 30, 1957.*

Special enrollment periods will be provided for new members, including recent graduates and those separating from the Armed Services.

## Ninety-Fourth Annual AVMA Convention Cleveland—August 19-22, 1957

Eight airlines, five railroads, four state toll roads, and two Great Lakes steamships provide easy access to the 1957 convention city from all points of the compass.

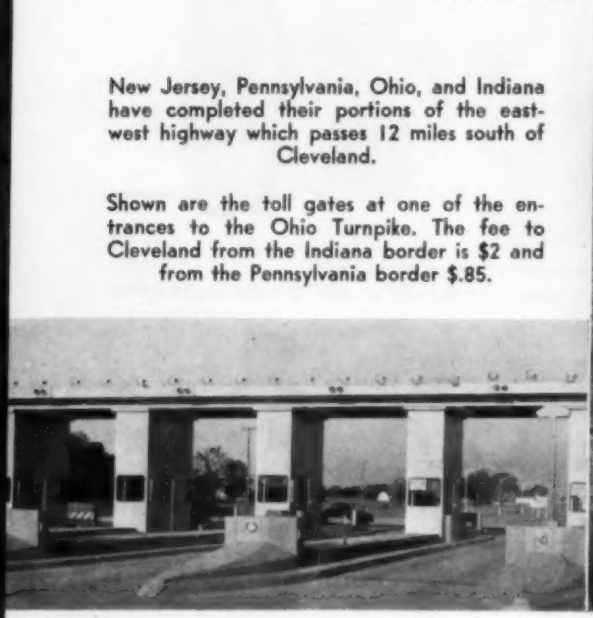
Because of Cleveland's central location on the southern shore of Lake Erie, the Association will not offer any tours in connection with the convention.

However, the State of Ohio, the shores and islands of Lake Erie, and the rolling countryside of the Ohio River Valley offer pleasant vacation opportunities with facilities for boating, fishing, swimming, and sightseeing. Future issues of the JOURNAL will give facts about Cleveland, Ohio, and air and rail transportation to the convention city.

### Ohio Turnpike

New Jersey, Pennsylvania, Ohio, and Indiana have completed their portions of the east-west highway which passes 12 miles south of Cleveland.

Shown are the toll gates at one of the entrances to the Ohio Turnpike. The fee to Cleveland from the Indiana border is $2 and from the Pennsylvania border $.85.



## Nominations Invited for New Gaines Award

The Executive Board has approved AVMA administration of a new award offered by the Gaines Dog Research Center. The purpose of the award is to foster progress in the field of small animal medicine and surgery by encouraging and recognizing achievements in that field.

The award will be offered annually, beginning in 1957, and will consist of a gold medal and $1,000 in cash.

*Basis.*—The award will go to that veterinarian whose work (within the preceding 5 years) in either clinical research or the basic sciences is judged to have contributed significantly to the advancement of small animal medicine and surgery.

The work or achievement shall have been published in recognized veterinary periodicals and/or presented at professional meetings.

*Selection.*—By a special *ex officio* committee of the Association consisting of the president, the chairman and secretary of the Section on Small Animals, and the two members of the Research Council representing the fields of Small Animal Medicine and Small Animal Surgery, respectively.

*Nominations.*—May be made by anyone. Each nomination shall include a description of the work done by the veterinarian nominated, a statement of how it has contributed to the advancement of small animal medicine and surgery, a pertinent bibliography of the nominee's published work, if any, and biographic information.

*Deadline and Rules for Nominations.*—Nominations should be addressed to: Committee on Gaines Award, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., and must be received not later than June 1, 1957.

*Eight* copies of the data and brief as outlined above must be furnished. The Committee will review the various nominations and select a recipient so that the award can be presented at the opening session of the AVMA convention in Cleveland, when other award presentations are made.

## STUDENT CHAPTER ACTIVITIES

### Colorado

**Colorado Student Chapter.**—Brigadier General Wayne O. Kester, AVMA president, was the guest speaker at a meeting of the Colorado A. & M. College Student Chapter of the AVMA held on Feb. 18, 1957.

President Kester spoke on the value of organized veterinary medicine, and reviewed the present status of the role of the veterinarian in the Armed Services. A number of questions regarding the military future of senior veterinary students were answered by General Kester.

s/DICK PARSLEY, *Secretary.*

## To Cleveland

**Service plazas are located at convenient distances along the route of the Toll Roads to provide fuel and service for the car and also relaxation for the occupants.**

## WOMEN'S AUXILIARY

President—Mrs. A. E. Coombs, Box 174, Skowhegan, Maine
Secretary—Mrs. F. R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind.

**Auxiliary Public Relations.**—Efforts to educate the general public concerning the services performed by the veterinary profession have been mostly limited to what the veterinarian has given his client across the examination table or what the large animal practitioner has been able to do in the field, when saving stock for his client after drug and feed store remedies have failed.

The AVMA office is keenly aware of this situation and is conducting a public education program, but the complete success of this plan is dependent upon the participation of every one of our auxiliary members.

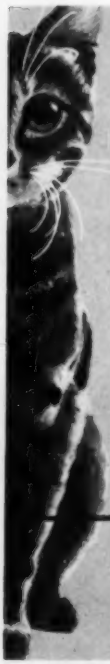
The radio project is one phase of this scheme. It is an effort to help the layman better understand the scope of veterinary medicine and also instruct the farmer and pet owner how to better care for their stock and pets. To date, there are approximately 30 radio stations in the United States and Canada with regularly scheduled veterinary public information programs; less than 15 of our affiliated auxiliaries actively participate in this project. This is much too small a percentage for effective results. The radio committee has compiled a folio on how to set up a participating program for your auxiliary, covering all necessary arrangements. The AVMA has prepared seven-minute radio scripts on all phases of veterinary medicine, and has just completed 13, 15-minute scripts on a variety of small animal subjects which are suitable for TV and radio presentation. An index of the subjects and samples of both types of scripts, as well as the radio committee folio, are available on request.

In addition, Mr. Forster, of the public relations department of the AVMA office, has asked the auxiliary members to collect anecdotes of the experiences of their husbands to be used in supplementing the factual stories that have already been prepared for general magazine publication. Usable anecdotes might include a typical day's schedule for a small or large animal practitioner, descriptions of and problems with clients, bungled efforts on the part of a client to help the veterinarian, examples of problems created or worsened by attempts at home treatment, etc.

Each anecdote should include enough clinical data so it can be related to a case covered more completely in the AVMA files and, thus, in the correlation of the two compositions, an interesting article is available for universal public consumption.

The radio committee would appreciate your cooperation and support on all of these AVMA projects.

s/Mrs. J. J. Fishler, *Chairman,*

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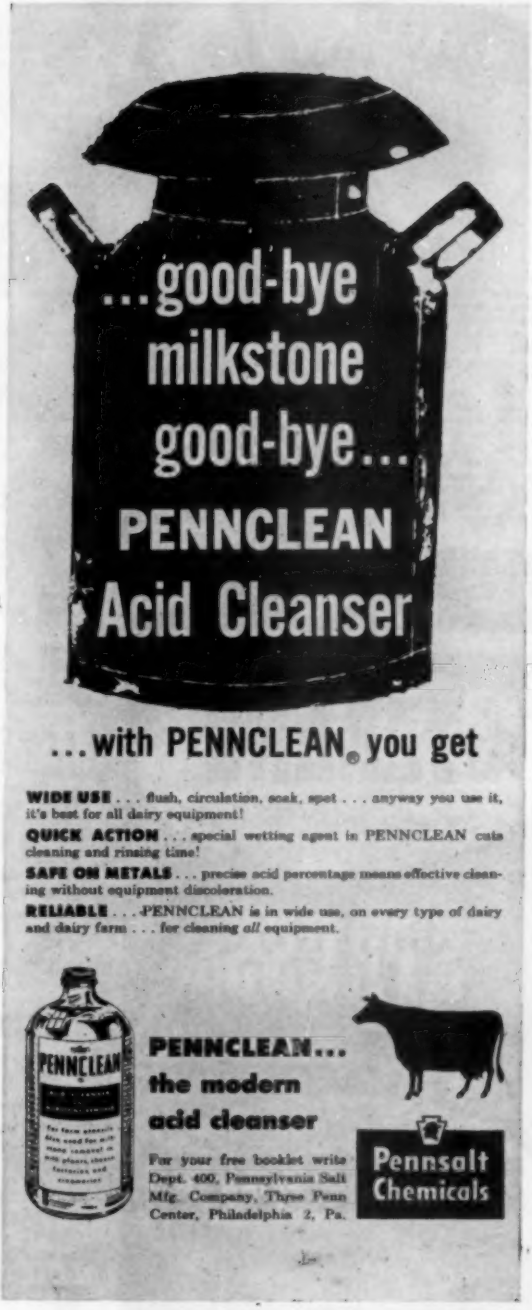
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## COMING MEETINGS

North Central Iowa Veterinary Medical Association. Annual meeting. Warden Hotel, Fort Dodge, April 18, 1957. H. Engelbrecht, P. O. Box 797, Fort Dodge, Iowa, secretary.

American Animal Hospital Association. Annual meeting. Sheridan Palace Hotel, San Francisco, Calif., May 8-11, 1957. W. H. Riser, 5335 Touhy Ave., Skokie, Ill., secretary.

Kansas State College. Conference for veterinarians. School of Veterinary Medicine, Manhattan, May 26-28, 1957. E. E. Leasure, dean.

Texas A. & M. College. Conference for veterinarians. Texas A. & M. College, College Station, June 6-7, 1957. R. D. Turk, chairman.

North Dakota Veterinary Medical Association. Annual meeting. Minot, N. Dak., June 17-18, 1957. Dean Flagg. 202 Teton Ave., Bismarck, N. Dak., secretary.

South Carolina Associations of Veterinarians. Summer convention. Fort Sumter Hotel, Charleston, June 20-22. Worth Lanier, York, S. Car., secretary.

Alberta Veterinary Medical Association. Annual convention, Lethbridge, Alta., June 21-22, 1957. H. C. Carlson, 9324 148th St., Edmonton, Alta., secretary.

Georgia Veterinary Medical Association. Annual meeting. Georgia Continuing Education Center, Athens, June 23-25, 1957. Charles C. Rife, 505 Lindbergh Dr., N.E., Atlanta 5, Ga., secretary.

Maritime Veterinary Association. Joint conference. Mount Allison University, Sackville, N. B., June 25-27, 1957. J. F. Frank, Division of Animal Pathology, Box 310, Sackville, N. B., chairman.

North Carolina Veterinary Medical Association. Annual meeting. Grove Park, Asheville, June 25-27, 1957. C. J. Lange, 3741 High Point Rd., Greensboro, N. Car., secretary.

Kentucky Veterinary Medical Association. Annual meeting. Brown Hotel, Louisville, July 15-16, 1957. Robert H. Singer, 136 Shawnee Place, Lexington, Ky.

Iowa State College. Annual conference for veterinarians. Memorial Union, Ames, July 16-17, 1957. M. S. Hofstad. Veterinary Research Institute, Iowa State College, Ames, program chairman.

Canadian Veterinary Medical Association. Annual meeting. Hotel Georgia, Vancouver, B. C., July 22-24, 1957. James Archibald, Ontario Veterinary College, Guelph, Ont., vice-president.

American Veterinary Medical Association. Annual meeting. Cleveland Auditorium, Cleveland, Ohio, Aug. 19-22, 1957. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Washington State Veterinary Medical Association. Annual meeting. Monticello Hotel, Longview, Sept. 9-10, 1957. William F. Harris, 1102 E. Main St., Puyallup, Wash., secretary.

New York State Veterinary Medical Society. Annual meeting. Hotel Statler, Buffalo, Sept. 11-13, 1957. M. H. Covert, 138 Inglewood Dr., Rochester 19, N. Y., secretary.

New England Veterinary Medical Association. Annual meeting. Equinox House, Manchester, Vt., Oct. 6-9, 1957. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

Florida State Veterinary Medical Association. Annual meeting. Fort Harrison Hotel, Clearwater, Oct. 13-15, 1957. Robert P. Knowles, 2934 N.W. 17th Ave., Miami 37, Fla., secretary.

Southern Veterinary Medical Association. Annual meeting. Hotel Roanoke, Roanoke, Va., Oct. 27-30, 1957. A. A. Husman, P. O. Box 91, Raleigh, N. Car., secretary.

Cornell University. Nutrition conference. Cornell University, Ithaca, N.Y., Oct. 31-Nov. 1, 1957. J. K. Loosli, Stocking Hall, Cornell University, Ithaca, N.Y., chairman.

by effective control of both
the **inflammation and infection**

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## Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2. Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda Contra Costa Veterinary Medical Association, last Wednesday of each month. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of


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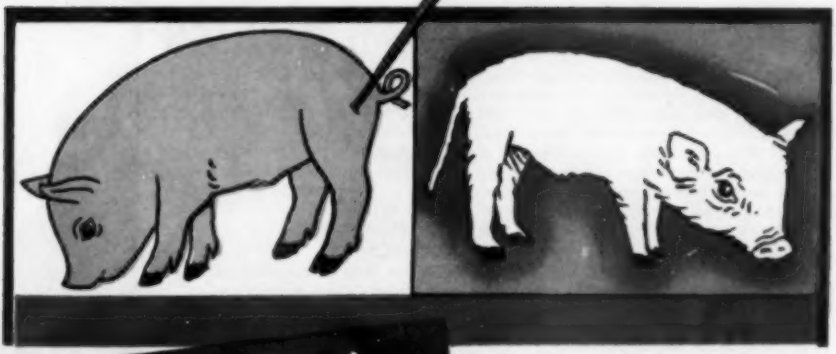

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KANKAKEE, ILLINOIS

Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyea, 5925 Edgewater Drive, Orlando, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant. P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. Harold A. Tennant, Atmore, Ala., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. Ross E. Evans, 5215 S. Dixie Highway, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

Suwannee Valley Veterinary Association, the third Friday of each month, at the Thomas Hotel, Gainesville, Fla. R. C. Mann, Rt. 1, Box 37, Ocala, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. H. V. Henderson, Reinbeck, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

East Central Iowa Veterinary Medical Society, the second Tuesday of every month. Dr. W. T. Rugger, Oxford, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Winneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc.,


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REFERENCES: 1. Bull, W. S., N. Amer. Vet., in press. 2. Henry, R. T., and Blackburn, E. G., Vet. Med., in press.

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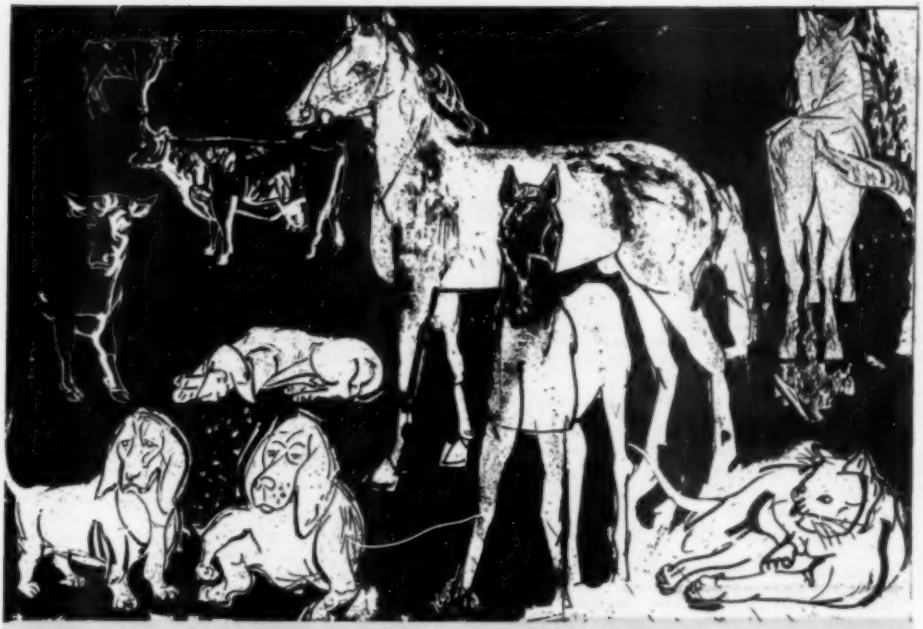

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the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlain, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. F. B. Duke, 49 Taylor St., High Bridge, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the third Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. W. E. Snyder, E. Kings Highway and Munn Ave., Haddonfield, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

New York State Veterinary College. Annual conference for veterinarians. Cornell University, Ithaca. W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y., dean.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.


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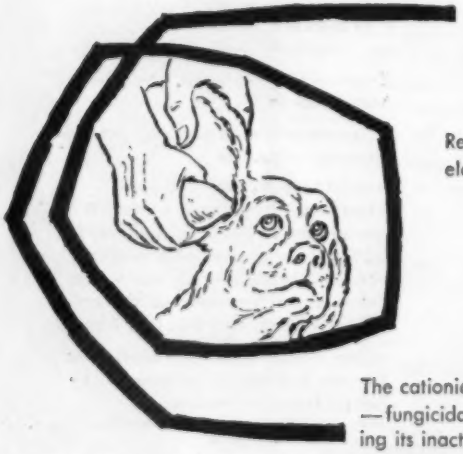

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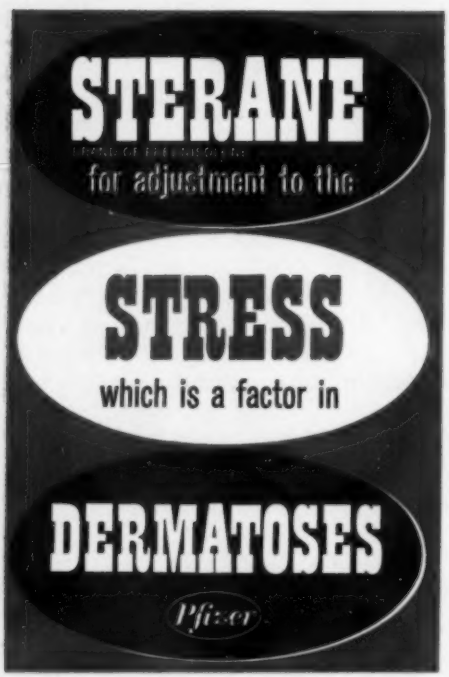



Piedmont Veterinary Medical Association, the last Friday of each month. John G. Martin, Boone, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forrest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary St., Richmond 20, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle, Wash. William S. Green, 9637 S. E. 36th, Mercer Island, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. L. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). R. J. O'Hern, P. O. Box 617, Cumberland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madison, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. E. S. Scobell, Rt. 2, Wausau, Wis., secretary.

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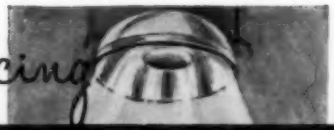

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**Mikedimide acts promptly to increase respiration, restore reflexes and shorten sleeping time.**

*Mikedimide* has a high therapeutic index, and no signs of toxicity have been observed. Animals can be put to sleep or awakened almost at will, by the alternate use of barbiturate and *Mikedimide* without any apparent harm to the animal.

**We present below abstracts of a few typical case reports pertaining to the use of *Mikedimide*:**

**Morphine sulfate (0.5 gr.) was administered subcutaneously and 3 cc. (180 mg.) of pento barbital sodium was given intravenously to a deep surgical plane. The subject suddenly ceased breathing. The heart was weak and reflexes were absent. Two and one-half minutes after respiratory arrest, 105 mg. of *Mikedimide* was given slowly intravenously. The amplitude of respiratory movements markedly increased. Reflexes returned within one and one-half minutes. The operation and recovery were uneventful. The sleeping time was shortened about two hours.**

**The patient was in shock and appeared to be a poor surgical risk. A single injection (45 mg.) of pentothal sodium was administered intravenously. Respiration ceased before the injection was completed. The heart was weak and all reflexes were absent. Within 30 seconds after respiratory arrest, 1 cc. (30 mg.) of *Mikedimide* was given intravenously. Respiration was resumed within 15 seconds. The heart became strong and the palpebral reflex returned in one and one-half minutes. Recovery was uneventful.**

**The patient was anesthetized with surital sodium (480 mg.), given intravenously. Reflexes were absent. respiration was slightly depressed and the heart was strong. Six minutes after anesthesia, *Mikedimide* (120 mg.) was injected slowly intravenously. There was an immediate respiratory response. The palpebral reflex returned at once. At the end of the *Mikedimide* injection, the dog tried to lift his head and sniffed the operating table. Fourteen minutes after the *Mikedimide* injection, the dog was almost conscious. The sleeping time was shortened by 50 percent and recovery was uneventful.**

**MIKEDIMIDE** *is indicated for*

1. Emergency treatment for barbiturate overdose and respiratory depression.
2. Routine antagonism therapy against barbiturate anesthesia.
3. Respiratory stimulant in the presence of barbiturates.
4. Shortening sleeping time under anesthesia.
5. Respiratory and circulatory supportitive drug in the presence of barbiturates.
6. Ambulating an animal shortly after surgery.
7. Achieving a "safe plane" of anesthesia during and after prolonged surgery.

**Your request for Technical Data, and a clinical supply of *Mikedimide* will be given prompt attention.** *At Your Supplier, or Write*

*Patent applied for.

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SOLE CANADIAN DISTRIBUTOR: Veterinary Medical Supply Co. of Canada, 6579 Somerled Ave., Montreal, Que.

"Devoted to progressive veterinary research for the development of superior products for graduate veterinarians."

# 3 SQUIBB *products in small*

NEW

## florinef-S

**Lotion Veterinary.** Florinef® (Squibb Fludrocortisone Acetate) combined with Spectrocin® (Squibb Neomycin-Gramicidin)

**...topical corticosteroid-antibiotic therapy with 10 to 25 times the anti-inflammatory action of Hydrocortisone. Reduces inflammation, controls itching, suppresses eruptions ...combats secondary infection.**

**Pharmacology**

Florinef-S lotion combines the anti-inflammatory, anti-pruritic, action of Florinef with the anti-bacterial action of Spectrocin for treatment of many dermatologic disorders of small animals. *Florinef* inhibits inflammatory reactions to bacterial, allergenic and other chemical agents, reduces erythema, suppresses eruptions, and combats itching.

*Spectrocin* is effective against many gram-positive and gram-negative organisms responsible for most superficial infections of the skin, and combats secondary infection with both bacteriostatic and bactericidal action.

**Indications**

Dermatitis (eczematoid, contact), anogenital pruritis, inflammatory lesions with secondary infection, pustular folliculitis, infected cutaneous ulcers, superficial bacterial infections of the external ear and ear canal, secondarily infected minor burns or other wounds, infections following minor surgery, prophylactic treatment of scratches, abrasions and burns.

**Supply and Administration**

15cc. plastic squeeze bottles.
Apply lightly and sparingly two to four times a day. Florinef-S is non-irritating and releases medicant readily. On weeping surfaces it mixes with exudates to give better contact with affected area.

# *for everyday practice animal therapy*

NEW

## mycostatin®

**Ointment Veterinary (Squibb Nystatin)**

**. . . topical antibiotic therapy for cutaneous fungal infections. Fast acting—well tolerated—superior ointment base.**

### Indications

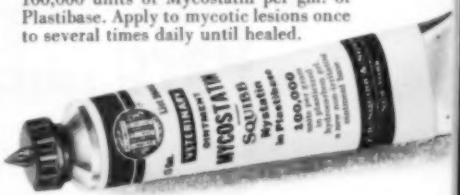
Mycostatin Ointment Veterinary has proved unusually effective for the rapid treatment of many superficial fungus diseases of animals, particularly when *Candida albicans* (Monilia) is the primary organism. Previously hard-to-treat dermatomycoses can be expected to respond promptly, and monilial lesions usually show improvement 48 to 72 hours after therapy has been initiated.

*Candida albicans* has not become resistant to Mycostatin in clinical trials, and no systemic or other adverse reactions have been observed. Squibb's superior Plastibase® insures rapid and thorough release of the antibiotic.

*To prevent monilial overgrowth which often results from therapy with broad spectrum antibiotics, broad spectrum therapy and antifungal prophylaxis can be administered simultaneously with MYSTECLIN.*

### Supply and Administration

15 and 30 gm. tubes, each containing 100,000 units of Mycostatin per gm. of Plastibase. Apply to mycotic lesions once to several times daily until healed.




## vionate®

**. . . 11 essential vitamins and 9 vital minerals in *balance*.**

Vionate is a vitamin and mineral diet supplement especially formulated for dogs, cats and other small animals. Vionate helps provide an adequate daily intake of fat-soluble vitamins, B-complex vitamins and essential minerals in proper ratio and balance.

| VITAMINS | | MINERALS | |
|---|---|---|---|
| Vitamin A | 37,000 U.S.P. units per lb. | Salt | 6.6% |
| Vitamin $D_3$ | 3,700 U.S.P. units per lb. | Calcium | 7.7% |
| Vitamin $B_1$ | 18 mg. per lb. | Phosphorus | 4.6% |
| Vitamin $B_2$ | 36 mg. per lb. | Iodine | .0018% |
| Vitamin $B_6$ | 4.5 mg. per lb. | Iron | .044% |
| Vitamin $B_{12}$ activity concentrate | 0.07 mg. per lb. | Cobalt | .00044% |
| Folic Acid | 1.8 mg. per lb. | Copper | .0044% |
| Niacin | 90 mg. per lb. | Magnesium | .066% |
| Pantothenic Acid | 45 mg. per lb. | Manganese | .148% |
| Vitamin E | 50 Int. units per lb. | | |
| Choline | 3,300 mg. per lb. | | |

### Indications

For prevention and treatment of vitamin and mineral deficiency diseases . . . as a source of additional vitamins and minerals for pregnant or lactating dams . . . to help promote sound teeth and bones . . . maximum growth, health, vigor . . . healthy skin free from "itch" . . . improved muscular coordination . . . good digestion . . . glossy coat . . . for follow-up therapy after stress.

### Supply and Administration

Vionate is available in 8-oz., 2-lb. and 10-lb. canisters. Vionate is added to food once each day, the amount to vary with size and weight of animal.

FLORINEF-S, MYCOSTATIN and VIONATE are available from your pharmacy, your favorite veterinary supply house, or your nearest Squibb Branch. For further information on these or other Squibb veterinary products, write: SQUIBB, *Veterinary Products Department*, 745 Fifth Avenue, New York 22, N. Y.

## SQUIBB QUALITY
**—THE PRICELESS INGREDIENT**

FLORINEF, SPECTROCIN, MYCOSTATIN, PLASTIBASE and VIONATE are registered Squibb trademarks.

☐ will he eat it?

☐ can he digest it?

☐ will it keep him fit?

You know dogs. We know meat. And Pard reflects this joint thinking carried out in Swift's own laboratories and kennels.

Thoroughly tested, Pard combines all the virtues of a really good dog food. 1) Meaty flavor dogs can't resist; 2) A nice balance between essential nutrients and the bulk needed for normal stools; 3) All the vital meat protein, vitamins and minerals required for sturdy bones, a healthy coat and boundless energy—plus valuable supplements to promote fruitful reproduction as well as general canine health.

Test Canned Pard and Pard Meal. Compare the labels. You'll find you can feed them separately or together with beneficial results—and with greater economy than other dog foods that lie uneaten.

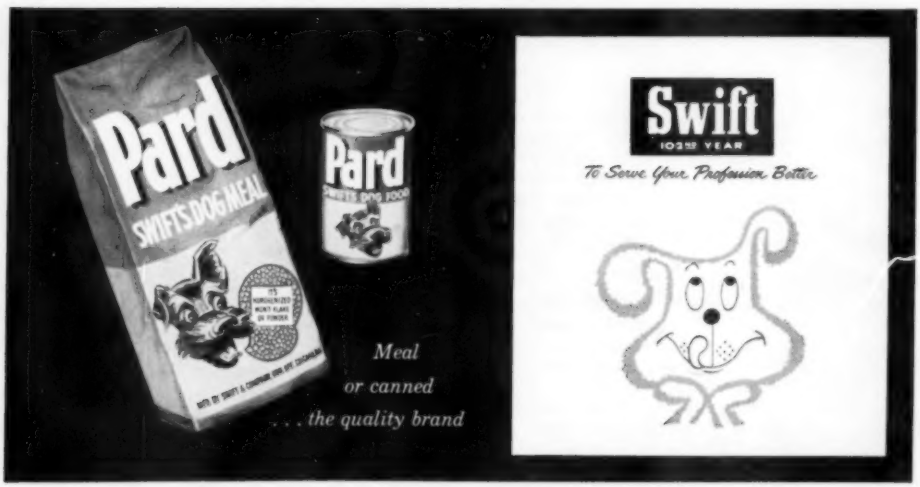
# how Pard solves your 3 big feeding problems

*made by men*
*who know meat . . . for men*
*who know dogs*

☆ **CANNED PARD**—with that *Good Beef Taste* that comes from beef, ground beef bone and the right amount of beef fat. A well balanced, nutritious feed formula that assures the needed minerals, vitamins and other basic nutrient elements.

☆ **PARD MEAL** . . . *meatiest dog-meal you can feed.* Contains more protein derived from meat than any other leading type of dog-meal . . . 248% more than the average of 5 other well-known brands. Economical—lets you feed up to 25% less—yet maintain high nutrition. In 25- and 50-lb. bags . . . homogenized or conventional flaked type meal.

**SWIFT & COMPANY** U.S. YARDS • CHICAGO 9, ILL.



*(before Paxital)*

*(30 minutes after Paxital)*

## NEW nonsedative animal tranquilizer

**Exclusively for veterinary use** Paxital, a new animal tranquilizer designed exclusively for veterinary use, produces a peaceful mental state *without sedation.* Animals remain normally responsive to surroundings. Paxital controls anxiety, nervousness and apprehension. It also appears to have a significant analgesic effect.

**Broad clinical application** Paxital is useful to eliminate barking and relieve nervousness or tension, especially in hospitalized animals. It is of value to reduce biting and scratching in skin conditions . . . for minor surgery when a general anesthetic is contraindicated or undesirable . . . as an adjunct in major surgery to permit smoother induction of anesthesia and an uneventful recovery (and to reduce the amount of barbiturates necessary) . . . to counteract shock and as an antiemetic.

**Dosage:** Average dose (for 20 to 30 lb. dog): *orally*—50 to 100 mg. two or three times daily, as indicated; *parenterally*—2 cc. (50 mg.). Paxital may be administered intravenously, intramuscularly or subcutaneously. Occasionally, an additional 2 cc. may be required to obtain the desired clinical response. Tranquilization is obtained usually within 45 minutes following oral administration. Onset of action following parenteral administration is more rapid.

*Contraindications:* Hepatic diseases or disorders. Central nervous system involvement.

**Packaging:** 25 and 50 mg. tablets in bottles of 100 and 500; 2 cc. ampuls (25 mg./cc.) in boxes of 10 and 50.

*Available through your ethical veterinary distributor.*

# Paxital*

BRAND OF MEPAZINE

*TRADEMARK

*Division of Veterinary Medicine* **WARNER-CHILCOTT**

## Schering Sponsors Symposiums

Approximately 500 graduate veterinarians attended three symposiums on the uses of Meticorten and Meticortelone in veterinary medical practice, during the past four months, according to Schering Corporation.

They believe these meetings were the first ever held for veterinarians on one specific group of pharmaceuticals. They were planned in order that attending veterinarians might learn of the broad range and the most recent advances in therapy with these two compounds. Each speaker was allowed sufficient time to cover his subject completely. The symposiums were held in New York City, Los Angeles, and Chicago—the last one in Chicago on February 28.

Abstracts of the most pertinent papers are being published and will be mailed to all veterinarians in the United States, according to Schering Corporation.

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**For JOURNAL dated *15th* of month — 22nd of month preceding date of issue.**

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

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Veterinarian wanted for small animals, metropolitan Detroit, for surgery, diagnosis, treatment, and to supervise grooming. Salary to start; later profit sharing. Please state professional and nonprofessional experience, previous employers, and marital status. Address "Box G 37," c/o JOURNAL of the AVMA.


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# demodectic mange?

**BEFORE SELEEN**—Hound had suffered from demodectic mange almost from birth. In spite of therapy with almost every type of skin medicament, condition grew steadily worse. Photo taken four days before first SELEEN treatment.

**AFTER SELEEN**—Marked improvement shows in elimination of mange mites and lesions, clearing of affected areas, regrowth of haircoat. Photo taken 19 days and three SELEEN treatments after first picture.

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These dermatological and ectoparasitic conditions can be extremely troublesome—to patient, client and veterinarian. Today, such conditions are most effectively, most conveniently controlled in dogs *and* cats with

## SELEEN®

(Selenium Sulfide, Abbott)

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*Why?*—Here's what you can expect when you treat these annoying conditions with SELEEN—

- *complete control* in 87% of nonspecific dermatoses . . . definite improvement in another 11%.
- *prompt relief* of itching and scratching . . . frequently after the initial treatment.
- *elimination of ectoparasites*, including fleas, lice and demodex mange mites.
- *thorough cleansing* of skin and haircoat . . . removal of tissue debris.

Like a shampoo, SELEEN lathers fast, rinses easily, has a pleasant odor and leaves no stains for carpets or furniture.

SELEEN Suspension, sold to veterinarians only, is supplied in 6-fl. oz., pint and economical gallon bottles. Order from Abbott Laboratories, North Chicago, Ill.; your nearest Abbott branch, or your distributor.

Abbott

A LONGER PRIME OF LIFE FOR YOUR DOG!

NEW HOMOGENIZED GAINES MEAL

Veterinarians wanted for regulatory field work in Nevada; ARS qualifications; no license required. Temporary and permanent positions available. Address Dr. J. B. Key, Secretary, P.O. Box 467, Tonopah, Nev.

Opportunity for experienced veterinarian, Florida license. Must be able to assume responsibility in small animal practice; $4,500 per year, plus 4% of gross. Prefer man with some capital to invest; good future. Address "Box G 28," c/o JOURNAL of the AVMA.

Want veterinarian as assistant in busy small animal hospital; northern New Jersey. Address "Box G 31," c/o JOURNAL of the AVMA.

Veterinarian wanted with advanced training and experience in bacteriology and virology for a poultry disease research position in a biological laboratory. Applicant should submit brief information on background, references, and general qualifications for interview appointment. Excellent future. Address "Box G 38," c/o JOURNAL of the AVMA.

Assistant veterinarian wanted in Cleveland small animal hospital. State references, experience, salary expected in first letter; Ohio license. Address "Box E 5," c/o JOURNAL of the AVMA.

**WANTED—ONE VETERINARIAN**

**Five acres fenced land ideal for veterinarian. Three-bedroom home and office; wall-to-wall carpet, radiant heat, built-in Hi-Fi, walk-in freezer, gasoline storage tank with pump, excellent water supply. Cost $75,000 in 1951; sacrifice, $49,500; terms. Forty-five minutes from Golden Gate Bridge in Valley of the Moon. Growing Sonoma has potential and need for additional practice. Address W. G. Raymond, Box 55, Sonoma, Calif.**

Veterinarian wanted as assistant in modern small animal hospital in suburb of New York City. Excellent opportunity and salary. Address "Box G 11," c/o JOURNAL of the AVMA.

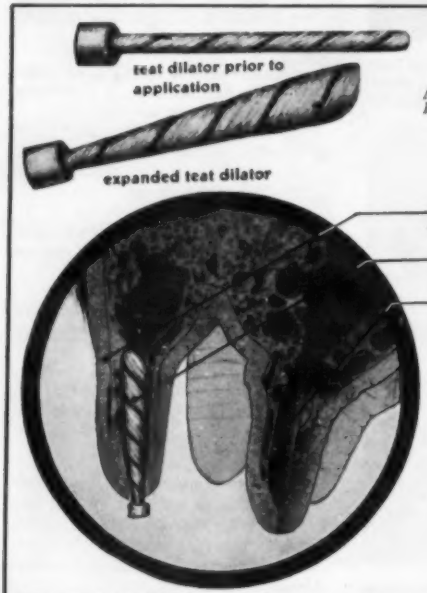
Assistant veterinarian wanted for busy small animal practice in western New York; excellent working conditions. State particulars and salary expected. Address "Box G 39," c/o JOURNAL of the AVMA.

Recent graduate wanted to assist in mixed practice in Southeast. Best located small animal hospital in area; potential not being realized; fine climate. Will consider 1957 graduate. Address "Box G 41," c/o JOURNAL of the AVMA.

**Wanted—Positions**

Graduate, 1955, 26, married, desires position leading to partnership in Middlewest mixed practice; licensed in Iowa. Being discharged from service, August, 1957. Address "Box G 15," c/o JOURNAL of the AVMA.

Graduate API 1955 seeks assistantship in busy, small animal practice, Southeast or Southwest. Age 30, married, licensed in Alabama and Louisiana; 2 years of experience in mixed practice. Address "Box G 25," c/o JOURNAL of the AVMA.

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A glance at these pictures is enough to tell you that this *Self-Expanding* TEAT DILATOR is not just a trat plug but a *dilator.*

ADVANTAGES: Safe, even and smooth *dilation.*

No danger of pressure necrosis. *Contains no metal.*

Intense, long-lasting, non-irritating disinfection.

No parts of dilator will remain in teat canal.

*Cannot be kicked out.*

SUPPLIED: in boxes of 15 teat dilators (1.77 inches), in boxes of 30 teat dilators (1.77 inches), with ointment for lubricating the dilator before inserting.

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# in Anthrax

*the way it was*

**"From what has been said of this disease it will be readily conceived that treatment will be doubtful in its results, and in most cases useless. Chief among the remedies provided are chlorate of potash, turpentine, carbolic acid, blood-letting, saline preparations, and locally — hot fomentations, stimulant embrocations and setons."**

McEachran, D.: Am. Vet. Rev. 3:108 (Jan.) 1879.

*the way it is*

"Some cases [of anthrax] failed to respond to penicillin therapy. Terramycin was then used concurrently with penicillin and the response was prompt and effective.

"More than 65 cases treated with Terramycin alone responded promptly. The initial dose was approximately 2 mg./lb. the first day, then 1 mg./lb./day as long as indicated.

"To date, 214 cases have been treated with Terramycin intravenously, Terramycin intravenously plus penicillin intramuscularly, and penicillin alone. In the majority of cases, Terramycin alone yielded the most satisfactory results." Bailey, W. W.: J.A.V.M.A. 122:328 (April) 1953.

Pfizer

# TERRAMYCIN

TERRAMYCIN INTRAVENOUS-VETERINARY Vials of 250 mg., 500 mg., 1 Gm. and 2.5 Gm. with Water for Solution, U.S.P.

TERRAMYCIN INTRAMUSCULAR-VETERINARY Vials of 100 mg., 1 Gm. and 5 Gm.

*sold to veterinarians only*

*Department of Veterinary Medicine*

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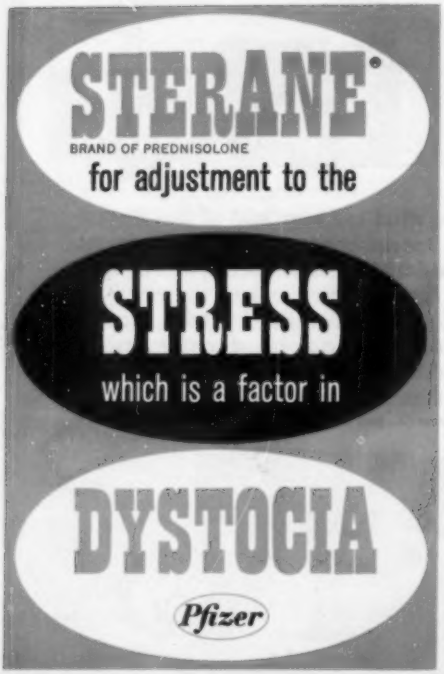



Young, single, experienced, veteran, Pennsylvania graduate, 1953, desires position in mixed or small animal practice, California. Excellent references. Available April 1. Address "Box G 26," c/o JOURNAL of the AVMA.

Graduate, 1956, approved school, experienced, mixed practice, desires position in mixed practice leading to partnership or lease. Married, veteran; no special location preferred. Address Box "G 35," c/o JOURNAL of the AVMA.

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Experienced small animal practitioner wishes to purchase on contract or lease with option a small animal practice. Licensed in Illinois and Wisconsin. Please state terms. Address "Box G 42," c/o JOURNAL of the AVMA.

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Newly licensed veterinary hospital for lease. Boarding kennels established in 1938, with high-class clientele, in fast growing Castro Valley; 30 minutes from San Francisco. Space for 60 dogs, runs for 32. Rent $250 for first 2 years and then $300, with an option for 20 years. Address 618 Blair Ave., Piedmont, Calif.

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A NEW EVSCO JET
THREE-HEAT HAIR DRYER
with Heavy-Duty Construction and Big-Machine Capacity!
NO FUSES, NO BRUSHES, NO PROBLEMS! Made of heavy duty cast aluminum. Thermodynamic engineering prevents heat loss. Contains self-cooling motor. Heavy Nichrome heating element provides for hours of continuous use. One switch control for low heat, high heat or cool air. Neoprene rubber nozzle resists grease, oil and dirt.
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Nozzle opening, 3". Air output at nozzle is 2400 linear ft. per min.; at normal room temperature, hot heat, 162°F.; warm heat, 128°F.; 115 volt, 60 cycle single phase AC operation; finished in gray baked hammertone.
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*...a simple solution to the difficult problem of moist dermatoses*

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(2% diphemanil methylsulfate)

- dries oozing lesions
- stops itching and scratching
- reduces spreading and secondary infection

**in 2 sizes:** 50 Gm. tube, boxes of 1, 12, 72.
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**to provide products of the finest quality and greatest effectiveness for the highest degree of successful veterinary practice**

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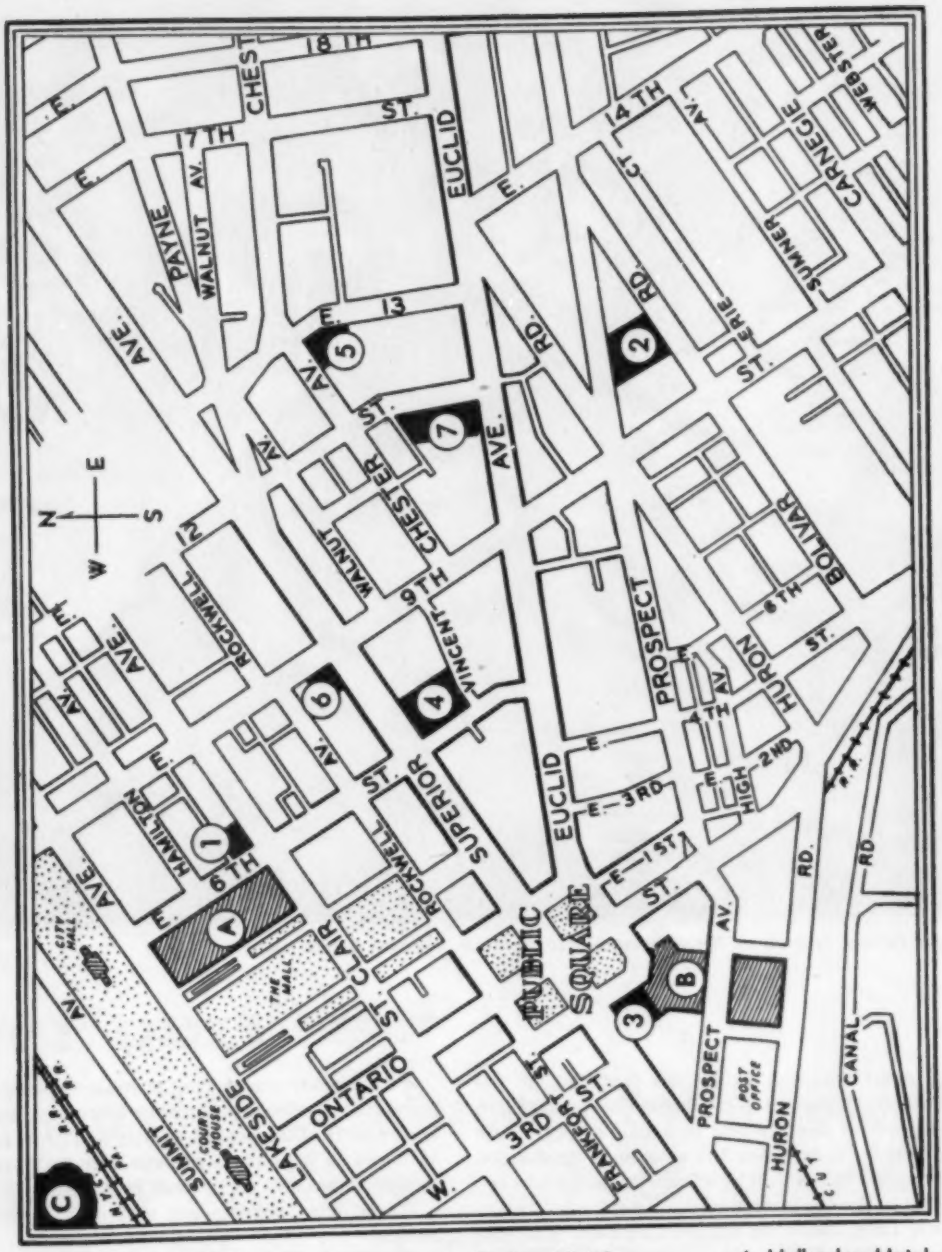


A. Cleveland Auditorium
B. Union Station
C. Stadium—Home of the Indians and the Browns

1. Auditorium Hotel
2. Carter Hotel
3. Cleveland Hotel
4. Hollenden Hotel
5. Manger Hotel
6. Olmsted Hotel
7. Statler Hotel

# HOTEL RESERVATIONS — CLEVELAND CONVENTION

## *Ninety-Fourth Annual AVMA Meeting, Aug. 19-22, 1957*

***All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.***

Hotels and Rate Schedule

| Hotel | Single | Double | Twin | Suite |
|---|---|---|---|---|
| 1. Auditorium | $4.75- 8.00 | $ 7.50-10.00 | $10.00-12.00 | $25.00 |
| 2. Carter | $5.50- 9.25 | $ 8.50-13.50 | $ 9.50-14.25 | $26.50-36.50*<br>$40.00-48.25† |
| 3. Cleveland | $6.50-11.00 | $ 9.00-14.00 | $10.50-20.00 | $20.00-55.00*<br>$44.00-70.00† |
| 4. Hollenden | $5.00- 9.00 | $ 8.00-12.00 | $ 9.00-14.00 | $20.00-30.00*<br>$30.00-60.00† |
| 5. Manger | $5.00- 9.00 | $ 7.00- 9.00 | $ 9.00-13.00 | $18.00-45.00*<br>$36.00-75.00† |
| 6. Olmsted | $4.25- 9.00 | $ 7.00-11.00 | $ 8.50-11.00 | $17.00-20.00 |
| 7. Statler | $6.00-13.00 | $10.00-16.00 | $11.00-18.50 | $24.00-32.00*<br>$48.50-48.50† |

*—2-room suite
†—3-room suite

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| Hotel | Accommodations |
|---|---|
| (Three choices MUST be shown) | _____Single Room(s) @ $_____ |
| First choice hotel _____ | _____Double Room(s) @ $_____ |
| Second choice hotel _____ | _____Twin-bed Room(s) @ $_____ |
| Third choice hotel _____ | _____2-room suite @ $_____ |
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Arriving on (date)_____ at_____( ) a.m. ( ) p.m.

Departing on (date)_____

Will be occupied by (attach list of additional names if necessary).

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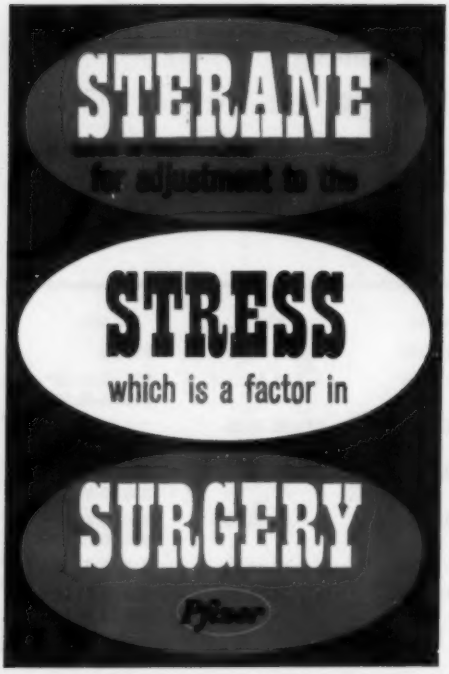


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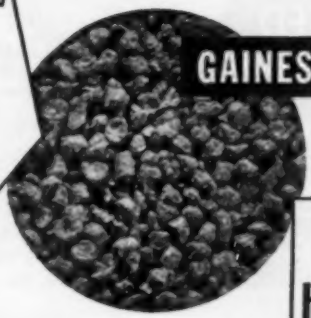


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### Dr. Sauter Joins Corn States Staff

Dr. Robert A. Sauter (COR '47) has left private practice at Albany, N. Y., to join the research staff of Corn States Laboratories, Inc., bringing a wide variety of clinical, research, and practical experience. He is a former staff member of Ellin

Dr. Robert A. Sauter

Prince Speyer Hospital for Animals and of the A.S.P.C.A. Hospital, both of New York City. He served four years in the Army Veterinary Corps and is a member of the AVMA and Omega Tau Sigma.

According to Dr. V. W. Gellen of Corn States, Dr. Sauter's appointment as head of Research, Development, and Clinical Evaluation, is part of the program of expanded production, and it is expected that his activities will increase the number of top-quality products available exclusively to the veterinary profession.


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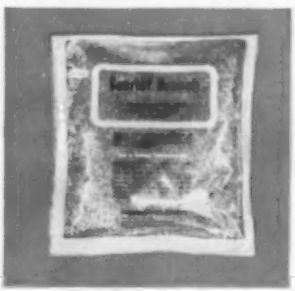

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